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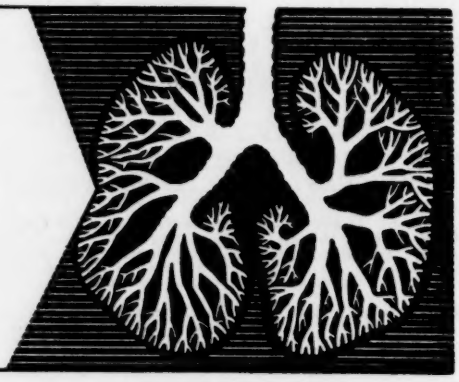

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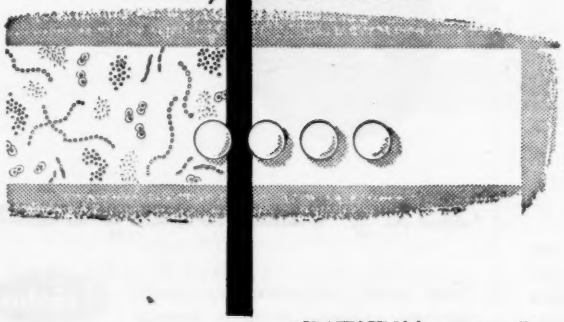

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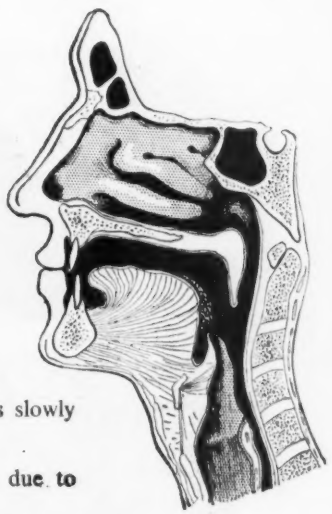

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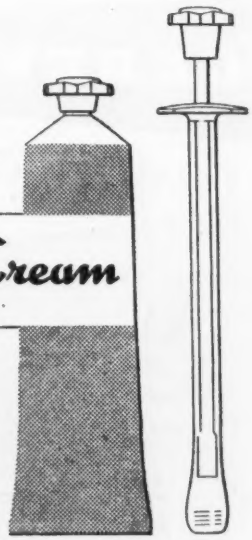

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Ortho Pharmaceutical Limited
HIGH WYCOMBE · BUCKINGHAMSHIRE · ENGLAND

LITERATURE ON REQUEST

CEREVON

Ferric Free organic iron therapy

. . . ferrous gluconate, an organic iron salt, has now established itself as superior to inorganic iron preparations in the treatment of iron deficiency anaemias.

Greater absorption and utilisation produce speedy therapeutic response. Furthermore, undesirable side effects of nausea and upset of the alimentary tract do not occur, even in patients normally sensitive to iron.

The Ferrous Gluconate used in our preparations is of our own manufacture and is entirely free from ferric iron.

CEREVON TABLETS

FORMULA: Each tablet contains: Ferrous Gluconate 0.3G.
Available in bottles of: 100 tablets. 1000 tablets.
Prices: 100 tablets 3/2d. plus P.T. 1,000 tablets 29/8d. plus P.T.

CEREVON ELIXIR

FORMULA: Each teaspoonful contains: Ferrous Gluconate 0.3G. Aneurine Hydrochloride 1 mgm. Riboflavin 1 mgm. Nicotinamide 10 mgm.

Available in bottles of:	4 fl. ozs.	20 fl. ozs.	40 fl. ozs.	80 fl. ozs.
Prices:	5/-	24/-	46/-	90/-

elixir or tablets CEREVON

Prescribe CEREVON by name on form E.C. 10.

CALMIC LIMITED · CREWE HALL · CREWE · TEL: 3251-5

London: 2, Mansfield St., W.1. Tel: LANgham 8038-9

HOMMEL

TRISAN REGD
HOMMEL

Sedative-Expectorant in Bronchial Asthma

Symptomatic treatment of bronchial asthma must include attention to expectoration — mucus plugging is now recognized as a cause of unexpected death—and mental sedation.

In 'Trisan' the two desiderata are effected by classically used drugs: Potassium iodide and Barbitone sodium, the latter reinforced by Chloral hydrate.

Composition
Potassium iodide B.P. 6.03%; Chloral hydrate B.P. 7.11%; Barbitone sodium B.P. 0.24%; Alcohol 4.00%; Excipient ad 100%

ACTION
'Trisan' is formulated to reduce spasm frequency, to ease expectoration and to reduce mental upset. *Contra-indicated* in hyperthyroidism.

DOSAGE
4 fl. drachms in water during attacks; for routine symptomatic management between attacks, 1 to 2 fl. drachms nightly for 2 to 3 weeks.

PACKS
Standard Bottle of 4 fl. oz.
Dispensing Bottle of 16 fl. oz.

Dormupax REGD.
HOMMEL

Clinically proved Superior Barbiturate

- Published literature in 1953 has confirmed that DORMUPAX is an hypnotic which possesses many advantages over barbiturates commonly used hitherto.
This results from the inclusion in Dormupax of a newly synthesized salt of barbituric acid — Calcium-ri-butyl-allyl-barbiturate. The new drug, reinforced by Carbromalum, provides for the first time in Dormupax a safe, prompt, powerful hypnotic which is free from after-effects.
It is particularly useful in psychiatric practice.

INDICATIONS
Clinical investigation shows that in organic cerebral disease including atheroma and intractable insomnia generally efficacy is satisfactory on dosage of half a Tablet in the afternoon, and 1 Tablet in the evening.
Also indicated in circulatory conditions requiring sedation.

DOSAGE
Max. daily dosage: 5 Tablets;
Max. daily single dose: 2 Tablets.

PACKS
Standard Tube of 12; Dispensing bottles of 250.

REFERENCE
- 'The Medical Press' 5981, 628, December 1953.

AVAILABLE ON THE N.H.S.

PROFESSIONAL SAMPLES & LITERATURE ON REQUEST

HOMMEL'S HÆMATOGEN & DRUG CO.,
121 Norwood Road,
London S.E.24

'HOMMEL' clinical range includes:—
DORMUPAX · HICOSEEN · HYPERYSIN · NYXOLAN · TRISAN

NON-VIRILIZING ANDROGEN

Androstalone

Methylandrostan — 17ol — 3one

ROUSSEL

No hirsutism, no hoarseness of the voice, nor other signs of masculinization have been noted with normal doses. Even with the high doses used in mammary carcinoma, marked virilization has been very rare, much less than with testosterone propionate.

DOSAGE INDICATOR,
full bibliography and samples **on request**

Oestrogen Antagonist and Pituitary Inhibitor

Of special value in a wide range of **gynaecological disorders** (dysmenorrhoea, premenstrual tension and mammary pain, meno-metrorrhagia, fibroids, endometriosis)

In **mammary carcinoma,** given by injection, it has proved as effective as testosterone on bone metastases, and more effective on soft-tissue lesions.

To promote Weight Increase

Clinical reports have indicated that it is of great value in increasing protein anabolism; in some cases even more effective than testosterone. **For retarded growth, underweight or convalescent patients, wasting diseases, and for the elderly.**

SUBLINGUAL ADMINISTRATION

Packings: Boxes of 12, and bottles of 100 and 500 glossettes

Basic N.H.S. cost

If dispensed from packs of	500	100	12
Cost to chemist for 12 tabs.	9/10	10/1	12/-

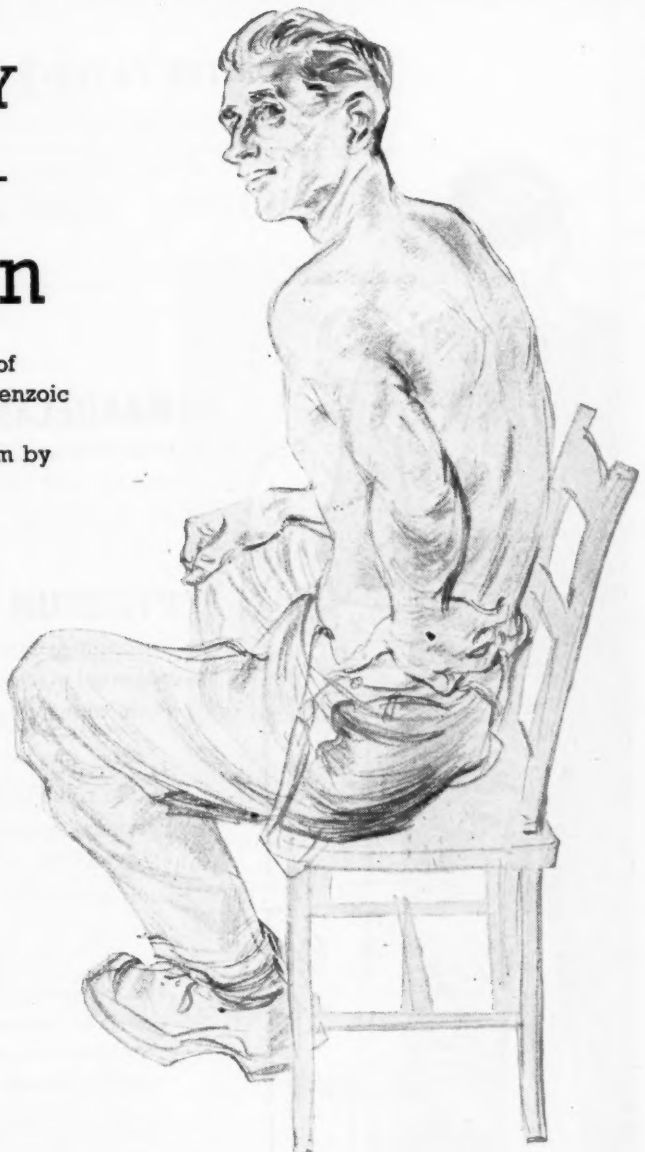
ROUSSEL

ROUSSEL LABORATORIES LTD.
843-847 Harrow Road, London, N.W.10. LADbroke 3608

NOW WIDELY PRESCRIBED—

Transvasin

Contains skin-penetrating esters of salicylic, nicotinic, and p-aminobenzoic acids. It brings real relief to deep-seated muscular rheumatism by simple inunction.



Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, and now available for prescription in this country, contains polar *esters* of salicylic, p-aminobenzoic and nicotinic acids. These esters readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed. Transvasin not only induces vasodilation of the skin with a superficial erythema but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on the skin.

It is now being widely prescribed, with highly successful results. There is evidence, also, that since a very small quantity is sufficient for each application the cost of treatment is extremely low.

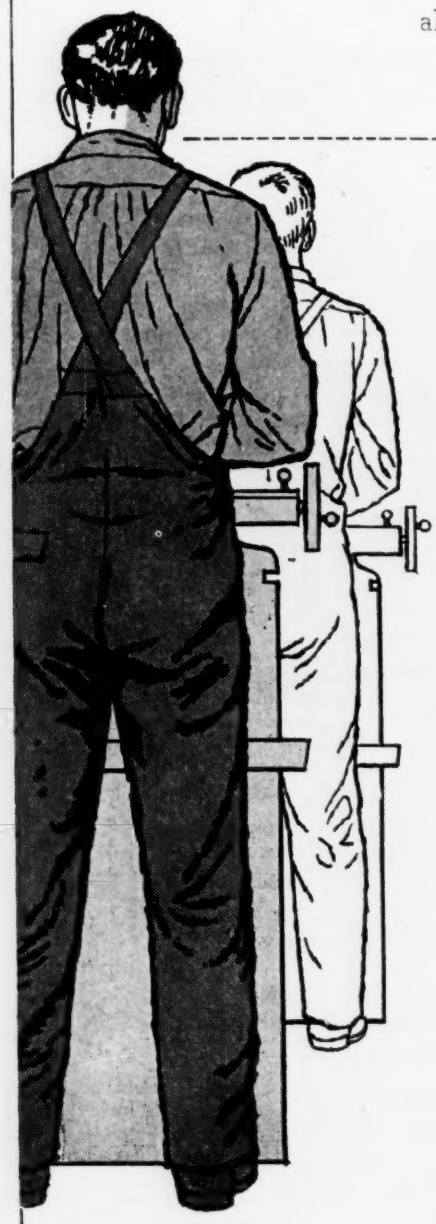
Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes at 3/4½ plus 7½d P.T., which are obtainable on form E.C.10, and is not advertised to the public.

Samples and literature will be gladly sent on application.

LLOYD-HAMOL LTD. 11 WATERLOO PLACE, LONDON, S.W.1 *WHItehall 8654/5/6*

FOR THE PATIENT with chronic urinary infection who needs to remain up and about 'Mandelamine' and 'Pyridium' play complementary roles



'MANDELAMINE' has an antibacterial potency equivalent to that of streptomycin and the sulphonamides without risk of drug-resistance.

'PYRIDIUM' gives quick relief from distressing symptoms, by analgesia of the urogenital mucosa, without the depressant effects of narcotics or general sedatives.

Used in combination 'Mandelamine' and 'Pyridium' give both effective antisepsis and gratifying symptomatic relief, with simple oral dosage and no arduous regimen.

Each 'Mandelamine' tablet contains 0.25g. (gr. 3¾) methenamine mandelate. Each 'Pyridium' tablet contains 0.1g. (gr. 1½) phenylazo-α-α-diamino-pyridine hydrochloride.

'Mandelamine' and 'Pyridium' are the registered trade marks of Nepera Chemical Co. Inc.

For cost to N.H.S., please see M & J list of costs dated October 1953.

MENLEY & JAMES, LIMITED
Coldharbour Lane, London, S.E.5

MUAP 103

Nulacin

CLINICAL STUDIES IN THREE CONTINENTS

CLINICAL STUDIES on the use of NULACIN tablets in the control of gastric acidity were reported in 1952.*

Now, further clinical studies, recently published in Australia, the United States, and Great Britain,† confirm the value of NULACIN.

INDICATIONS

NULACIN tablets are indicated whenever neutralization of the gastric contents is required:—in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

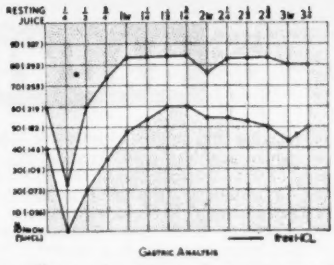
NULACIN provides control of gastric acidity comparable with that obtained with intragastric milk alkali drip therapy and is a most convenient and effective form of treatment for bed and ambulatory patients.

DOSAGE: Beginning half-an-hour after food, a NULACIN tablet should be placed in the mouth and allowed to dissolve slowly.

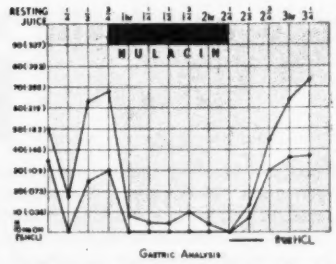
During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

NULACIN tablets are not advertised to the public and have no B.P. equivalent. May be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists . . . 2/-.) Also available in tubes of 12.

NULACIN tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol Menth. Pip. q. s.



Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer



Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.

REFERENCES:

*The Control of Gastric Acidity, Brit. Med. J., 180-182, 26th July, 1952.

*Medical Treatment of Peptic Ulcer, Med. Press, 195-199, 27th February, 1952.

†The Effect on Gastric Acidity of "Nulacin" Tablets, Med. J. Aust., 823-824, 28th November, 1953.

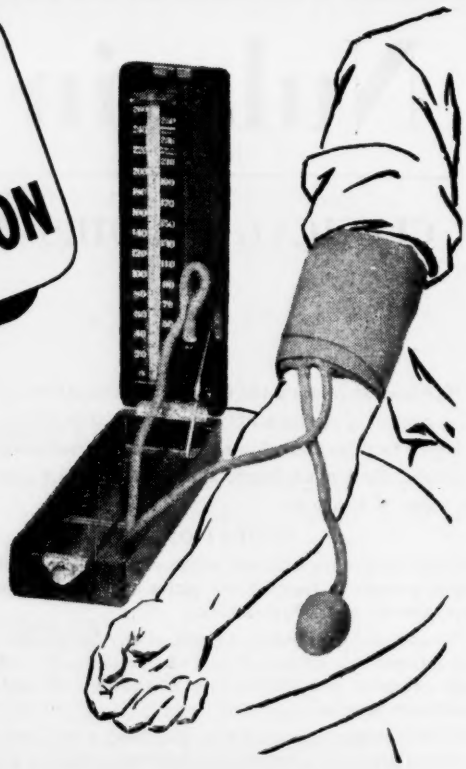
†Control of Gastric Acidity by a New Way of Antacid Administration, J. Lab. Clin. Med., 42:955 (1953).

†Further Studies on the Reduction of Gastric Acidity, Brit. Med. J., 183-184, 23rd January, 1954.

NULACIN is available from Horlicks in
U.K. · U.S.A. · CANADA · AUSTRALIA · NEW ZEALAND
CEYLON · MALAYA · INDIA
and is also distributed in most other countries throughout the world.

HORLICKS LIMITED, *Pharmaceutical Division, Slough, Bucks.*

A STRIKING EXAMPLE OF DRUG COMPLEMENTATION



IN MODERATE, SEVERE AND RESISTANT HYPERTENSION

• • • • **RAUWILOID + VERILOID**

The calming, relaxing and mildly hypotensive effect of Rauwiloid, when combined with the more potent Veriloid (brand of standardized alkaloids of Veratrum viride), leads to a unique type of drug complementation. The patient's Veriloid requirement is decreased, side effects, if present, disappear and significant hypotensive response is produced. Not only are the diastolic and systolic pressures lowered significantly, but also at the same time the patient feels better. Headache and dizziness disappear and tachycardia, when present, is replaced by mild bradycardia.

On the basis of this apparent synergism, Rauwiloid+ Veriloid leads to excellent results in moderate, severe and resistant hypertension. Each tablet contains 1 mg. of Rauwiloid and 3 mg. of Veriloid. Average dose : one tablet three or four times daily, preferably after meals, at intervals of not less than four hours.

In mild and labile hypertension . . . .

• • • • **RAUWILOID**

Rauwiloid produces excellent results in early, mild or labile hypertension. Blood pressure is significantly reduced, a sense of well-being is quickly experienced and mild bradycardia replaces tachycardia. Toxic reactions do not occur, even when the amount of drug administered is three or four times the usual dose. Side effects are rare. Initial dose : 4 mg. (2 tablets) once daily; maintenance dose: 2 mg. daily. Rauwiloid is a standardized alkaloidal extract of Rauwolfia serpentina. Each batch is tested in dogs for its sedative, hypotensive and bradycardic effects. Hence pharmacological uniformity is assured.

"RAUWILOID" and "VERILOID" are Registered Trade Marks

REGD. USERS:

RIKER LABORATORIES LTD. 29 KIRKEWHITE ST., NOTTINGHAM

ORIGINAL PRODUCTS OF RIKER RESEARCH.

For treatment of

ALLERGIC CONDITIONS

Synopen

REGD. TRADE MARK

Sufferers from allergic diseases, previously denied many pleasurable pastimes, particularly in the summer months, can, since the introduction of anti-histamine therapy, enjoy a more normal existence.

Owing to its favourable therapeutic index and notable freedom from side effects, especially absence of drowsiness, Synopen is the anti-histamine of choice.

Synopen is indicated for all allergic conditions, and may be administered safely to those who must necessarily continue their normal occupations during treatment.

Synopen tablets containing 25 mg. of N-dimethylaminoethyl-N-p-chlorbenzyl-α-aminopyridine hydrochloride are available in packs of 20, 100 and 200, and are prescribable on N.H.S. Form E.C.10.

Literature and Sample available on request

Geigy

PHARMACEUTICAL LABORATORIES GEIGY LTD.

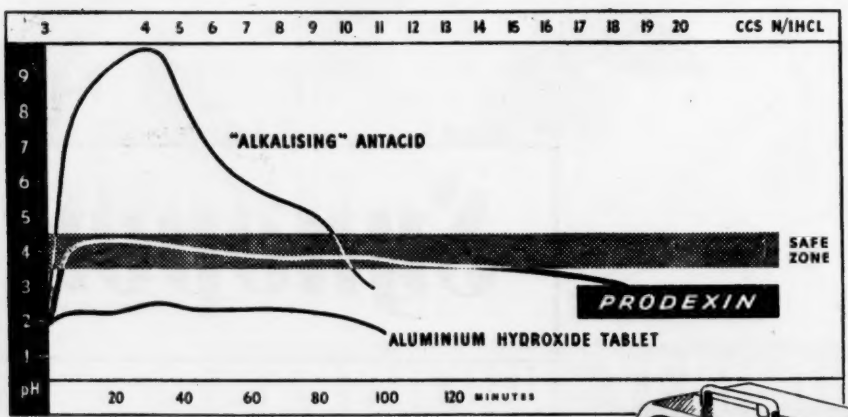
Rhodes, Middleton, MANCHESTER.

PH. 60

*N 15

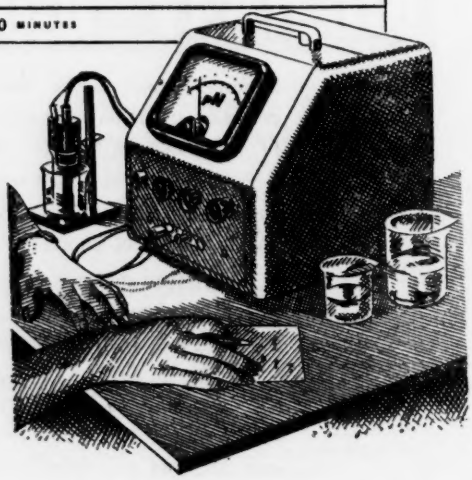
A New development providing CONTROLLED antacid therapy

Prodexin is a new product containing aluminium glycinate, and belongs to the buffer group of antacids. It depends for its action upon the slow release, on hydrolysis, of active aluminium hydroxide gel and glycine (amino acetic acid). Glycine rapidly raises the pH to 2, sparing the aluminium gel for the later stage of raising it into the "safe zone" of pH 3·5 to 4·5. Prodexin maintains an equable gastric environment for long periods without alkalisation.



Prodexin provides a convenient, economical and safe treatment for HYPERACIDITY and PEPTIC ULCER.

The tablets, sucked one at a time, maintain the pH of the stomach contents within the "safe zone" for up to two hours. With Prodexin there is no risk of acid rebound or alkalosis. Prodexin tablets are pleasant to suck and they do not form gritty particles in the mouth or give rise to constipation.



PRODEXIN

Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
(*dihydroxy aluminium aminoacetate*)
Light magnesium carbonate.....0·1 gramme.

The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

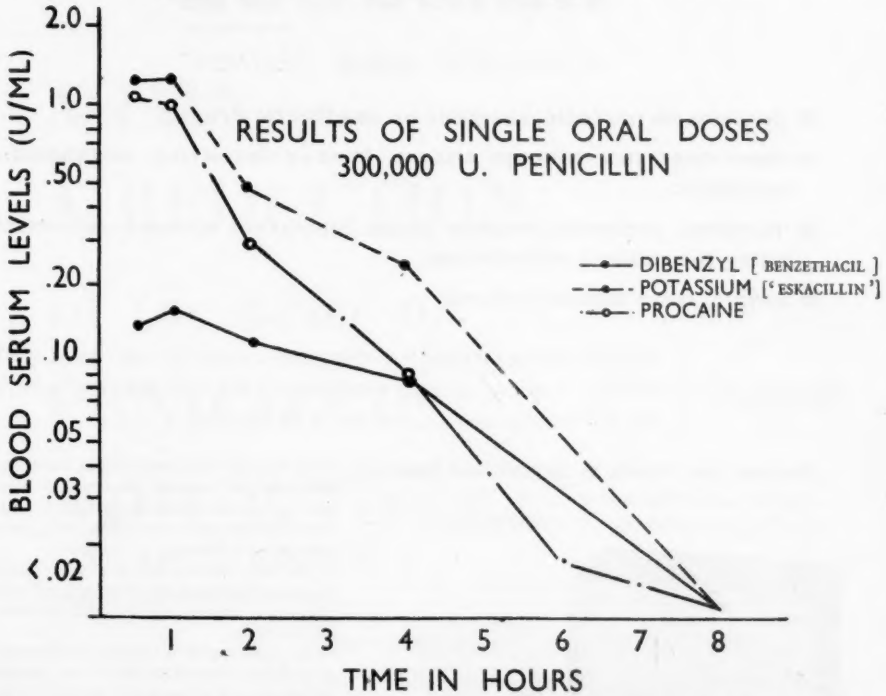
Manufactured in the laboratories of

C. L. BENCARD LIMITED

MINERVA ROAD · PARK ROYAL · LONDON N.W.10

BENCARD

'The peak serum concentrations are significantly higher . . .'



Studies comparing orally administered potassium penicillin G and benzethacil have shown—

that *potassium penicillin G gives higher peak serum concentrations and equally sustained therapeutic levels.*[1]

that, *from the point of view of absorption, potassium penicillin G is the more reliable.*[2]

50 'ESKACILLIN' 100

A PALATABLE SOLUTION OF POTASSIUM PENICILLIN G
THE IDEAL ORAL PENICILLIN FOR ALL AGES

1 *Antibiot. Chemother.* (1953), **3**, 593-9. 2 *J. Lab. clin. Med.* (1953), **42**, 417-29.

For cost to N.H.S., please see M & J list of costs dated October 1953

MENLEY & JAMES, LIMITED, COLDHARBOUR LANE, LONDON, S.E.5

for Smith Kline & French International Co., owner of the trade mark 'Eskacillin'

ECF1

An outstanding advance in treatment of Hæmorrhoids and allied conditions

HEMOSOL

REGD. TRADE MARK

A NON-GREASY ***LIQUID*** *TREATMENT*

- **Contains no narcotic, analgesic or anæsthetic drugs.**
- **Penetrates sub-mucous tissues. Vaso-constrictive, decongestive, antiseptic.**
- **'Hemosol' promotes healthy tissue formation without over-stimulating the mucous membranes.**
- **Simple, clean administration.**

INDICATIONS: INTERNAL AND EXTERNAL HÆMORRHOIDS · PRURITUS ANI · ANAL FISSURE FISTULA · HÆMORRHOIDS OF PREGNANCY · POST-OPERATIVELY, ASSISTS IN THE PROMOTION OF HEALTHY TISSUE FORMATION.

Abstracts from reports by Surgeons and Physicians

(The originals of these and many other similar reports are available to members of the Medical Profession.)

Prescribable under the N.H.S. on form E.C.10.

After having tried many other remedies, a surgeon states that he considers 'Hemosol' the best remedy for pruritus and the distressing condition of thrombosis of piles. He comments on the ease of application and the non-greasy advantage of 'Hemosol'.

A physician reports that in a case where suppository treatment had made no difference, 'Hemosol' was very effective in treating bleeding hæmorrhoids following confinement.

Other cases reported include the complete healing of an obstinate case of fissure in ano, considerable relief in a severe case of prolapsed hæmorrhoids, a markedly reduced inflammation and improved tone in a case of acute proctitis with a lax sphincter and rectal prolapse. A number of doctors reported having used 'Hemosol' to treat themselves with equally satisfactory results.

THE COST per application of 'Hemosol' at the basic price per 6 oz. bottle is less than 1¼d, which is considerably less than the cost of most other hæmorrhoidal treatments and their National Formulary equivalents. When prescribing 'Hemosol' (for N.H.S. and private patients) the 'Hemosol' Rectal Syringe need only be issued to patients using 'Hemosol' for the first time.

A COMPLIMENTARY BOTTLE will be sent upon request to doctors who have not previously had one, for trial in difficult cases of hæmorrhoids.

ACTIVE INGREDIENTS

Ext. Kramer Sicc. B.P.C., Ol. Pic. B.P.C., Acid Boric B.P. Tinct. Hamam. B.P.C., Glycerol B.P.

'Hemosol' is available on prescription only and is *not* advertised to the public.

DON S. MOMAND LTD.

58 ALBANY STREET, LONDON, NW1

Sole Distributors for United Kingdom and Eire for

ACETEST *a test for Ketonuria* · **CLINITEST** *a test for Glycosuria* · **HEMOSOL** *for Hæmorrhoids*

THE DISTILLERS COMPANY
(Biochemicals) Limited

AGAIN
A REDUCTION
in the price of
PENICILLIN

NOW 2s.7½d. *per mega unit*
FROM 29 MARCH
(Subject to the usual discounts)

The wide use of penicillin makes a reduction in its price a factor of major importance in the economics of general and hospital practice. We have pleasure, therefore, in announcing that through continuing improvements in methods of manufacture, we are able to reduce yet again the price of penicillin. Full details of all the new prices are available from our distributors or from your local pharmacist.

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PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD.

THE DISTILLERS COMPANY (BIOCHEMICALS) LIMITED
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NOW AVAILABLE!

Novo
SEMILENTE
Insulin

80 units per ml.

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80 units per ml.

VIALS OF 10 ml.

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EVANS MEDICAL SUPPLIES LTD

LIVERPOOL & LONDON

434

"Have you heard?

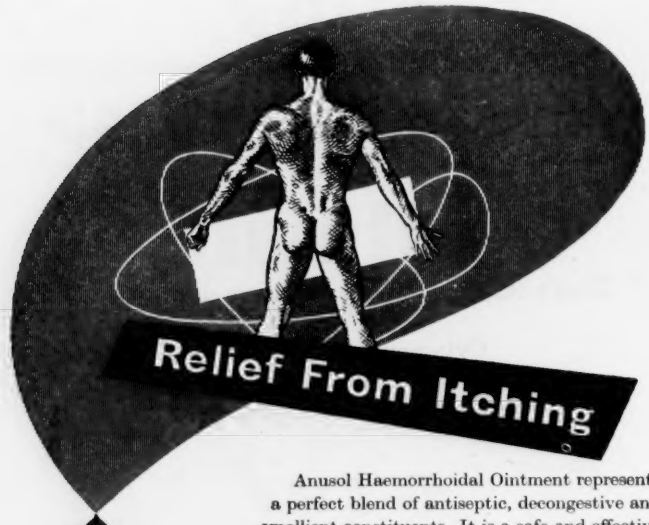
CRYSTAPEN and the other injectable penicillins are down in price again."

"That's only half the news. B_{12} is down too—Cytamen and Cytacon. The vitamin that Glaxo isolated, remember?"

The following products are reduced in price:

BENAPEN • CRYSTAPEN FOR INJECTION
ESTOMYCIN • ESTOPEN • MYLIPEN
PROCAINE PENICILLIN OILY INJECTION *Glaxo*
PROLOPEN • SECLOPEN • CYTACON • CYTAMEN

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX BYRon 3434



Relief From Itching

Anusol Haemorrhoidal Ointment represents a perfect blend of antiseptic, decongestive and emollient constituents. It is a safe and effective palliative for use in peri-anal conditions such as pruritus and eczema. It may be used in conjunction with Anusol Haemorrhoidal Suppositories in the treatment of piles; its bland and soothing consistency make it of particular value in peri-anal pruritus.

FORMULA: *Bismuth subgallate 2.12%, Bismuth oxyiodogallate 0.03%, Bismuth oxide 0.87%, Resorcin 0.87%, Balsam of Peru 1.77%, Zinc oxide 10.60%, Boric acid 17.85%, Base of cacao butter and beeswax q.s. ad 100.00%.*

PACKING: *Ointment: 1 oz. tubes. Suppositories: Boxes of 12; also boxes of 100 for dispensing purposes (not subject to P.T. on prescription).*

ANUSOL

No Warner product has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD.,
Power Road, London, W.4

Relief

from allergy . . .

BENADRYL, probably one of the most potent histamine antagonists, has proved to be of great value in the treatment of hay-fever, urticaria, vasomotor rhinitis, angio-neurotic oedema and, in the majority of cases, gives long looked-for relief in the skin infections and pruritic conditions associated with allergy. The Parke Davis range of products which include Benadryl provide for oral administration, topical and ophthalmic application and a solution for injection where, in acute allergic conditions, rapid action is required.

BENADRYL CAPSULES
BENADRYL ELIXIR
BENADRYL CREAM
CALADRYL
Cream and Lotion
BENADRYL OPHTHALMIC
BENYLIN EXPECTORANT
BENADRYL EMPLETS
BENADRYL PARENTERAL
BENA-FEDRIN
Nasal Decongestant

BENADRYL

A SUCCESSFUL ANTIHISTAMINE

Parke, Davis & COMPANY, LIMITED (Inc. U.S.A.)
HOUNSLOW, MIDDLESEX
Telephone HOUNSLOW 2361

Improved outlook in hypertension

Hexamethonium was the first of the ganglion-blocking agents to be used widely in the control of hypertension, and its introduction undoubtedly marked a major advance in the drug treatment of this disease syndrome.

Now, 'Ansolysen' brand of pentolinium tartrate has been developed and introduced. This new drug possesses significant advantages over hexamethonium and merits consideration in the treatment of selected hypertensive patients.

★ When given by mouth, it reduces blood pressure much more readily, without undue toxicity, and in smaller doses than do hexamethonium salts given orally.

★ The duration of the hypotensive effect is more prolonged than with hexamethonium salts, and dosage adjustments are less frequently needed.

★ There is less marked development of drug tolerance, and those who have become relatively insensitive to hexamethonium are often fully susceptible to 'Ansolysen'.

'ANSOLYSEN'

trade mark *brand*

PENTOLINIUM TARTRATE

Average Drug Tariff Basic Costs

24 x 40 mgm. tablets	1s. 8½d.*
24 x 200 mgm. tablets	5s. 5½d.*
10 c.c. multi-dose containers of 0·5% solution	3s. 4d.
25 c.c. multi-dose containers of 2·5% solution	11s. 8d.
25 c.c. multi-dose containers of Retard solution	14s. 0d.

(**Prices for dispensing packs of tablets*)

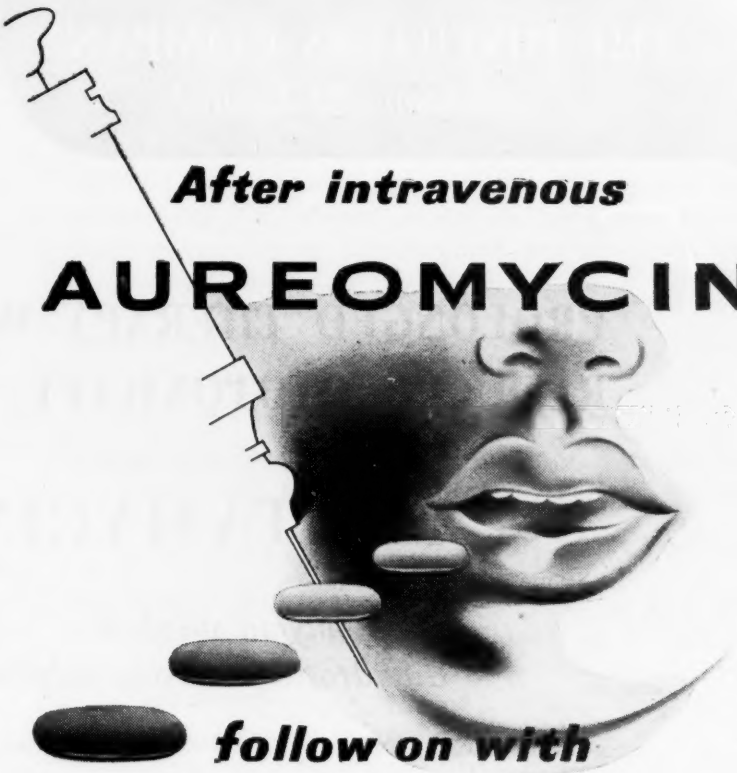
AN M&B *brand* MEDICAL PRODUCT

Manufactured by

MAY & BAKER LTD

MA1723A

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM



After intravenous

AUREOMYCIN

follow on with

ORAL CAPSULES

After instantaneous blood levels have been achieved in emergency conditions by intravenous injection of Aureomycin, the use of Aureomycin Oral Capsules provides a dependable, convenient and economical method of continuing the therapy. Aureomycin capsules enable high concentrations of the antibiotic to be maintained in the tissues in a wide range of infections of bacterial, rickettsial, large viral and unknown aetiology.

AUREOMYCIN INTRAVENOUS
Vials of 100 mg. and 500 mg. buffered with sodium glycinate

AUREOMYCIN CAPSULES
50 mg., bottles of 25 and 100. 250 mg., bottles of 16 and 100

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Lederle
FOR LEADERSHIP

LEDERLE LABORATORIES DIVISION
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THE DISTILLERS COMPANY
(Biochemicals) Limited

PROLONGED THERAPY WITH REDUCED OTOTOXICITY

'MIXTAMYCIN'
brand

streptomycin sulphate
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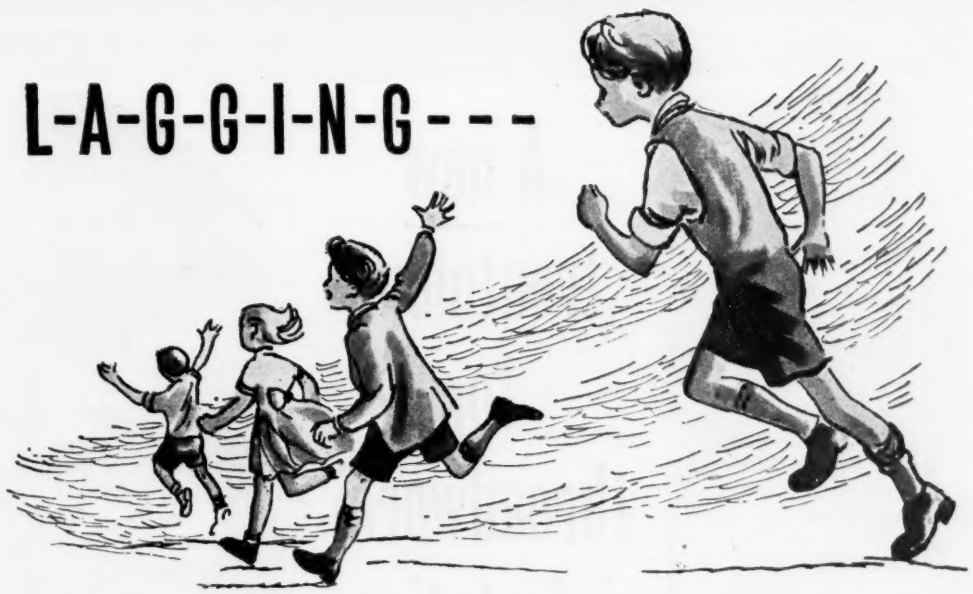

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PAIN AS AN OLD FRIEND

JOHN PENMAN
M.B. Lond., M.R.C.P.

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THE conclusions reached here, though based only on work in one narrow field, are probably applicable to all cases in which severe pain of long standing is brought to an abrupt and permanent end.

A series of 275 patients, who had been relieved of tic douloureux by alcohol injection of the trigeminal sensory root, was followed up by interview for periods varying from six months to five years. Elsewhere [1] I have given my diagnostic criteria of this disease, which were strictly adhered to in the present series, and have described the system of follow-up in greater detail. Unsuccessfully treated patients were also followed up but do not concern us here. Two facts about the treatment need to be stressed:

1. In about 90% of cases, if it is carried out carefully enough, it causes life-long trigeminal sensory loss and life-long relief. Usually one can form a reliable opinion whether relief will be life-long, and can state it to the patient, two days after injection.

2. This permanent sensory loss is very often accompanied by equally permanent and decidedly disagreeable paræsthesiæ, which begin gradually and seldom reach full intensity until some weeks after injection. Since even some of the best-balanced and most uncomplaining patients mention that they have these sensations and since all who have them describe them in nearly identical terms, one cannot doubt that they have a constant neuropathological basis, as yet unknown. Individual emotions about them, as we shall see, vary greatly. All patients in this series had been thoroughly warned of them before consenting to treatment.

At first the object of the follow-up was almost exclusively to collect neurological data. There was no intention of making any close study of the patients' emotional reactions to treatment, which it was assumed would consist only of gladness at the loss of pain, often mingled with vexation from paræsthesiæ. There are obviously some people whom nothing will make happy; but even they, it was thought, would be less unhappy without tic douloureux than with it.

As it turned out, more than a few patients were discontented or low-spirited after injection, or vaguely regarded themselves as ill. Their state of mind could not be ascribed wholly to paræsthesiæ, for several reasons. Some of them had neurotic symptoms in the first few days after injection, when paræsthesiæ had scarcely begun. Others, later on, had paræsthesiæ of which they did not complain much and neurotic symptoms of which they complained a great deal. Still others made paræsthesiæ their chief complaint, but were inconsistent about the severity of them, saying in effect that tic douloureux had been intolerable, that the new feelings in the face were certainly to be preferred to it, and yet that life was no less intolerable than before. Here and there a patient stated that the paræsthesiæ were as severe as the former pain, but stated it unconvincingly; and nearly always his relatives, comparing his past and present behaviour, found the statement hard to believe.

Patients with other symptoms besides or instead of paræsthesiæ described them in phrases of this kind: "I'm always ready to cry"; "I always seem to be tired"; "I don't seem to be myself yet"; "I suppose the injection took a lot out of me." In point of fact many of them, as their relatives agreed, looked five or ten years younger than before treatment, and had gained a stone or more. Some, perhaps with greater insight than the rest, were apologetic: "I know I oughtn't to feel like this; there's no real reason for it; please don't think I'm ungrateful."

Gradually it became clear that not infrequently the actual loss of pain had brought unhappiness. Thenceforth, belatedly, the histories were amplified so as to include more of each patient's social, occupational, and psychiatric background. It was soon found that certain emotions about results of treatment and certain ways of life tended to go together, so that to a large extent patients could be arranged in groups. These will be described below, with some illustrative cases.

Of all patients with tic douloureux, about 5% suffer also from disseminated sclerosis, one symptom of which is emotional lability, and therefore no case combining both diseases has been included in this series. Disseminated sclerosis rarely if ever begins with tic douloureux, and so is unlikely to appear later on among the present cases.

Classification and Illustrative Cases

The size of each group will be indicated in its heading, but these figures, being based only on indefinable concepts such as gladness and misery, must not be regarded as exact; in particular, it was often questionable whether a patient belonged to group I or group II. Percentages will therefore be given only in round numbers. Patients' ages, where stated, are those at injection.

GROUP I: UNRESERVEDLY GLAD: 62 PATIENTS (20–25%)

Many of these patients were below the average age of the series, and nearly all were fully occupied in satisfactory work.

Case 1.—A. B., aged 36, was the son of an omnibus driver, and with the aid of art scholarships had established himself as a professional painter and theatrical costume designer. He lived for his painting and drawing, which tic douloureux had much interrupted for nearly four years, and which a few days after injection he energetically resumed. At follow-up his only comment on his treatment was: "You've no idea how wonderful it is to be able to draw again."

GROUP II: GLAD DESPITE SOME DISTRESS FROM PARÆSTHESIÆ, AND WITH NO OTHER SYMPTOMS: 156 PATIENTS (ABOUT 55%)

These might be called average patients; few of them were exceptionally young or old and most were housewives or men with ordinary occupations.

GROUP III: WITH SEVERE NEUROTIC SYMPTOMS SOON AFTER TREATMENT: 6 PATIENTS (2%)

All but 1 of these patients had clear motives for being ill.

Case 2.—C. D., an unmarried woman, aged 75, was a retired domestic servant without hobbies. She shared a house with two sisters of hers, aged 81 and 83, who since the onset of her tic douloureux two and a half years earlier had waited on her and taken over her share of the housework. She was injected successfully and without complication, and about four hours later was in tears. Asked next day how she was, she said she felt terrible; questioned for details, she added that she felt awful. No evidence of physical illness was found. The following day, when told that she was well and could go home, she replied resentfully: "When I get home I shall have to go straight to my own doctor, that's all. I shan't be able to carry on like this. It's not myself I'm worrying about, it's my sisters. How will they look after me?"

At follow-up she was morose and polysymptomatic, and admitted that she was doing almost nothing. With bold ingenuity, conscious or unconscious, she had turned her very laziness into a claim for sympathy: "When I've had my dinner I feel very heavy, I've only got to close my eyes and I go off to sleep." Dinner was at midday. One of her brothers, and the wife of another brother, who came with her on different occasions, each remarked that she seemed to be "putting it on" in order to make her sisters work for her.

1. Penman, J. *Postgrad. med. J.* 1950, **26**, 627.

The transformation from one in frequent severe pain, but not weeping, to one out of pain, but weeping, was dramatic and could not by any feat of reasoning be called an improvement.

The remaining 5 patients in this group were: a spinster, aged 73, without any occupation, income, home or relative interested in her, and living temporarily in the house of a charitable acquaintance; a man, aged 56, with epilepsy, congenitally deformed feet (for which he had undergone ten operations), a previous history of neurosis, and an ingrained liking for being in hospital; a divorced woman, aged 52, estranged from all her relatives and living alone; a widow, aged 45, living alone except for a weekly visit from her daughter; and a housewife, aged 65, living in apparently satisfactory circumstances with her retired husband.

GROUP IV: WITH MILDER, LONGER-DEFERRED NEUROTIC SYMPTOMS: 25 PATIENTS (ABOUT 10%)

Many of these patients were housewives who were childless or whose children had grown up and left home. Most of them, for no obvious reason, felt tired, sad, or both, and nearly all threw off those symptoms within a year. One could only surmise that in a good many cases the patient's husband had been more attentive to her in her pain than after she had been relieved of it.

These frankly neurotic episodes prompted the question whether some of the distress attributed to paræsthesiæ might also be neurotic.

GROUP V: PATIENTS IN CONSTANT MISERY, ATTRIBUTED BY THEM TO PARÆSTHESIÆ: 26 PATIENTS (ABOUT 10%)

In this group many patients were inactive, dependent, and old.

Case 3.—E. F., a widow, aged 80, lived with her unmarried daughter, who was out at work all day. Besides tic douloureux she had a mild paraplegia, due to subacute combined degeneration of the cord, which restricted her walking. Her only hobby was "sitting at the window and watching people go by." Within six months of injection she said that she had gained nothing by it, so severe were her paræsthesiæ; but her general practitioner, who took great care of her and always brought her to the follow-up clinic, did not agree with her.

In some cases the key to the situation lay neither in old age nor in over-dependence on others, but in pure idleness and loneliness; and in some the advice to work, after being proffered and rejected a number of times, was accepted and soon followed by a considerable improvement. Both these points are exemplified in the next case.

Case 4.—G. H., aged 51, had been separated for twenty years from her husband, who still paid her a regular allowance. A second source of income was a social club of which she was part-owner. Since her only child was grown up and rarely met her, and since she had no intellectual resources, she did nothing except look after the flat in which she lived alone, and visit her club, which she said she sometimes helped to run. Though always willing to admit that she had been worse off with tic douloureux, she said that the present feelings in the face made her life a misery. Whenever the idea of work was suggested, she dismissed it as absurd.

One year and ten months after injection, at her own request, she paid an extra visit to the follow-up clinic, insisting that the paræsthesiæ were worse than ever and asking what could be done. Again she was recommended to work, and unexpectedly agreed to do so for a trial period of two months.

At her next routine visit, two years after injection, her opening words were: "It's a nice day, and I feel as good as the day." For the past eight weeks she had been a part-time barmaid at a public house owned by one of her sisters, who was paying her like any other employee; the paræsthesiæ were very much less noticeable and she was happy. She explained: "I meet a lot of people and a good many of them say I'm looking better."

Two and a half years after injection she wrote that she was feeling very well, and added: "I am still doing my little job."

In one case the remedy of work proved successful despite old age.

Case 5.—I. J., a man, aged 71, began soon after injection to complain of paræsthesiæ in much the same terms as the two last-quoted patients. When asked what he did, he seemed puzzled for a moment, but then replied: "If I feel up to it I do a little fishing, but I don't often feel up to it." Eighteen months after injection he was strongly urged to find an occupation, and six months later, at the age of 73, he wrote as follows (his spelling has not been corrected):

> Dear Sir, I have done what you told me to do when I last payed a visit to you at your clinic. I have started work again and I am feeling a lot better and happier for it. I started work on the 20th of June [i.e., six weeks after being urged to do so] and mixing with the men I used to know seems to make me more contented. I hope you will excuse me for not coming to see you on the 5th of November because we are very busy on Armourment work. I hope I shall be able to come and see you when this year is out. Hoping this will meet with your approveal, Yours sincerely, I.J.

When seen two years after injection he was cheerful, and four years after injection he wrote still in a fairly contented vein, mentioning paræsthesiæ but not complainingly.

A mental change of the kind observed in the last two cases is a more fundamental and important achievement than relief of any pain.

Some patients were much influenced by relatives bent on making the worst of things.

Case 6.—K. L., a housewife, aged 65, was the mother of fifteen healthy children and said she had had no serious illness in her life except tic douloureux, which shortly before injection she described calmly. Her chance of being satisfied with the treatment seemed good. Within a month of injection, however, she was complaining bitterly of paræsthesiæ. Her companion at follow-up was one of her daughters, who gave details of the patient's symptoms as if they were her own, and also retailed the views of other members of the family. Some of the patient's sons had offered robust encouragement, but they were seldom at home, whereas her husband, who was always at home, often told her: "It seems to me you're worse off than before." Her daughters all openly agreed with him and condemned their brothers' attitude as callous. It seemed clear that her family's prevailing opinion about the injection was disapproval of the doctor for not providing a cure without any disadvantages.

My latest information about her, seventeen months after injection, was that she had been going repeatedly to another neurologist and wearying him with her complaints. Finally, though he agreed with me that she had permanently lost all perception of pinpricks throughout the territory of the injected trigeminus, he had referred her to a neurosurgeon, whose opinion and advice have not yet been reported.

The Parts Played by Age, Duration of Pain, and Psychiatric Factors

Age.—Many patients who were dissatisfied after losing their pain combined, as we have seen, the qualities of inactivity, dependence on others, and old age. Were they dissatisfied because they were inactive and dependent, their old age being incidental, or because they were old, their other qualities being incidental? This question is important in those cases in which dissatisfaction took the form only of complaints about paræsthesiæ; for if old age seemed to be the more essential factor, then it could be argued that perhaps the unknown neuropathological process underlying paræsthesiæ grows more intense with age—in other words, that perhaps the older patients were not more given to complaining but merely had a more unpleasant symptom. However, the dissatisfied included a fair number of inactive or dependent people still in middle life (as in case 4), but only very few active, independent people of any age. The part played by age was therefore probably indirect and incidental.

Duration of Pain.—The dissatisfied patients included none whose histories of tic douloureux were exceptionally short, but the satisfied had histories ranging from a few

months up to thirty-six years. A certain minimum period, perhaps about six months, seems to have been necessary for a patient to become attached to his pain; but the attachment was probably always fully formed in that period if it was going to be formed at all. There is no evidence that it went on growing stronger with every year that passed.

Psychiatric factors were almost certainly paramount. The patients destined to be satisfied with their treatment, despite its drawbacks, were in general those who had no past histories of neurosis, were energetic at work, had absorbing interests, and were independent in circumstances and outlook.

Discussion

Samuel Butler, lamenting a lost book of peculiar value to him, wrote: "I feel as Wordsworth is generally supposed to have felt when he became aware that Lucy was in her grave, and exclaimed so emphatically that this would make a considerable difference to him, or words to that effect." He went on, however, to question the truth of what was generally supposed. Pointing out that the nature of the difference was not explained to us, he put forward the unexpected theory that Wordsworth welcomed Lucy's death as a release from an irksome engagement, if indeed he did not murder her. No less unexpectedly, when a patient loses a pain and cries "Oh, the difference to me!" his cry may be one of grief. This is irritating, but we must try to understand it, if medicine aims at the well-being of patients besides the cure of diseases.

Given time, pain may become:

1. The sufferer's chief occupation. This may be genuinely inevitable, and in any case other people, not in pain, feel in no position to advise him to occupy himself differently.

2. A stimulus to bravery, giving the patient a justified sense of effort and achievement. As one woman, depressed six months after injection, said half-regretfully: "With that [i.e., tic douloureux], I was all keyed up."

3. A refuge from some intolerable situation, and hence an alternative to a neurosis.

4. Grist to the emotional mill of some relative or friend belonging to the class of professional sympathisers. In their ministrations these people are impelled by sentimentality, vanity, or aggressiveness, and their message to the patient is: "Few besides you could bear this trial, and few besides me could support you in it." To them a cure of the pain is the premature close of a drama in which they had an agreeable part.

5. Above all, a habit, round which a cluster of other habits may grow up. Some patients in the present series, after treatment, needed much dissuasion from still wearing scarves round their heads day and night against draughts.

To patients in whom forces of these kinds are at work, cessation of their pain brings not only a gain on the physical roundabouts but also a loss on the emotional and social swings. Therefore they either become depressed or seek a new symptom to take over the functions of the pain.

On these mental processes tic douloureux casts an exceptionally clear light, for three reasons. First, the pain of it is very severe, and if even its loss can be regarded with mixed feelings, so presumably can the loss of any other pain. Secondly, the cure of it is life-long and one can tell the patient so at an early stage (here I disregard the chance, which is about 1 in 20, that the pain may begin later in the other side of the face). Thirdly, most sufferers from it are otherwise in good health, and after treatment can look forward to the remainder of a normal span of life. There are other pains, however, of which much the same can be said. One is sciatica, which may be cured by excision of a prolapsed intervertebral disc only to be replaced by pain, said by the patient to be no less severe, at the site of laminectomy. Another is the pain of peptic ulceration, which may be cured by partial gastrectomy only to be replaced by other abdominal pains or psychogenic headache. Everyone who relieves patients of any chronic severe pain, and follows them up, will probably discover similar syndromes, or rather variants of the same syndrome, neglect of which may have grave consequences. Additional and useless operations may be carried out—trigeminal sensory rhizotomy for paræsthesiæ, a second laminectomy in search of a second prolapsed disc, or a second laparotomy for hypothetical complications of the first. The patient may go the round of the special departments: after trigeminal operations, to the ear-nose-and-throat, dental, and eye departments; after laminectomy, to the orthopædist and the rheumatologist; after partial gastrectomy, to the neurologist because of headache. The time which experts thus spend on the patient, without necessarily helping him, may be very great. These devious paths converge at last on the psychiatrist, who finds that each stage of the journey has given the patient a fresh physical explanation of his symptoms, allowed them to become further ingrained, and so added a fresh hindrance to psychiatry.

Many of the above mishaps could be prevented or mitigated if the following measures were adopted.

1. Curable severe pain should very seldom be given time to become chronic. Earlier diagnosis and more up-to-date knowledge about treatment are required.

2. If the pain has become chronic, the patient awaiting its radical treatment should have his personality and social circumstances assessed by the actual doctor who proposes to carry out the treatment; or, if that seems a counsel of perfection, at least by someone working closely with him. Many of the patients who are likely to miss their pain can then be recognised by the features described earlier in this paper; to them one must point out that if they are cured everyone will expect them to fend more for themselves, and to their relatives one must say that, when the pain ceases, fresh complaints may begin.

3. Nearly every radical treatment has at least one major drawback, of which all patients awaiting it must be insistently warned; otherwise those who miss their pain will seize on the drawback as proof that something has gone wrong, and that they are still ill. The doctor proposing to carry out the treatment must himself give the warning, which is liable to go unheeded if anyone else gives it.

4. Whenever it is possible the patient must be followed up, not merely by postal inquiries (though they have their supplementary uses), but by interviews with the doctor who gave the treatment. Those who are purely depressed can usually be helped considerably by reassurance. The patient who has other neurotic symptoms, or finds the drawbacks of the treatment intolerable, can often be influenced to some extent through his relatives, especially if they were warned before the treatment. The greatest service they can render him, they should be told, is to persuade him that he is well and ought to be more active.

To the first of the above proposals there will presumably be no objection; but to the remaining three it will be objected that neither medical nor surgical specialists can spend so much time on each patient, nor act as psychiatrists. On the contrary, if each specialist, by seeing rather more of a patient, avoids referring him to several others, all will have their time saved; and in any case it is better to cure fewer patients, who will mostly agree that they are cured, than to leave a more numerous trail of the technically cured but dissatisfied. Some ability to detect and treat psychiatric disturbances is necessary for all clinicians, and especially for one who relieves chronic severe pain; indeed it would be slightly absurd for him to specialise in a pain but not in the common mental effects of relieving it. Provided he maintains a follow-up by interview, the

patient is more likely to listen to him than to anyone else, since he gave the treatment, still evidently believes in it, and still takes an interest in the case. Even the worst grumblers, with very few exceptions, will consider him the best person to grumble at and will continue to visit him; sometimes, as in case 5 above, a late psychiatric cure can be brought about. Once a dissatisfied patient is referred elsewhere because of his dissatisfaction, he is apt to infer that the treatment is a complete failure and that it was a blunder to give it to him.

Medicine and surgery will doubtless gradually conquer many painful conditions which until now have necessarily been allowed to become chronic. With each such conquest it will become more important to aim at early treatment, and, where that is not achieved, to observe, understand, and oppose the tendency of certain patients to grow attached to their pain. Indeed this paper ought perhaps to have been headed "Illness as an old friend"; recent developments in the surgery of congenital heart-disease, for example, may well create problems similar to those discussed here.

Summary

To some patients even the severest of chronic pains, from long familiarity and incidental advantages, becomes a treasured possession. When cured of it they become depressed, or overemphasise the inevitable drawbacks of the cure, or find other symptoms. Observations of these reactions, made during a follow-up of patients relieved of tic douloureux, are reported here in the hope that they will prove applicable to the relief of any long-standing severe pain. Doctors who relieve such pain should study the personalities of their patients before treatment, try to pick out those who are attached to their pain, and be ready to deal, themselves, with subsequent emotional disturbances. The best method of dealing with them is to conduct a follow-up by interview, meeting not only the patient but also his relatives. Prevention, by relief of the pain before it can become chronic, is of course even better.

In writing this paper I received valuable encouragement and constructive criticism from Dr. Desmond Curran, to whom I give my best thanks.

PAIN-SENSITIVITY TESTS

THE PRESSURE ALGOMETER

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IN 1934 Libman described his simple method of assessing individual sensitivity to pain by pressure on the styloid process. This was a first attempt at objective representation of the sensitivity factor in relation to patients' symptoms. Libman gauged sensitiveness

"by first pressing the thumb against the tip of the mastoid bone, and then slipping the finger forward and pushing against the styloid process [fig. 1]. Pressure on the normal mastoid bone causes no pain and therefore serves as a control. Pressure in the direction of the styloid process is painful to some individuals and not to others. The sensitive point is really not the styloid process but a branch of the auricularis magnus nerve."

With this test Libman classified people into three groups:

(1) O sensitive: "no evidence of pain, and who state they feel none."

(2) + sensitive: "evidence little pain or show none, but in response to questioning say yes." Both these groups were classed as "hyposensitive."

(3) +++ sensitive: "evidence of marked pain, or while they may control the expression of pain admit that the test is definitely painful." This group was classified as "sensitive."

Fig. 1—Libman's test: lobe of ear drawn forwards to show site of pressure.

The distinction between groups 2 and 3 is difficult not only because the pressure applied is unmeasured but also because their defined limits appear to overlap. In spite of these drawbacks the test has been found useful in the assessment of symptoms.

The importance attached to tests for pain sensitivity may be gauged by the numerous methods devised for ascertaining it. Goetzl et al. (1943) noted 82 different methods involving the application of mechanical, chemical, electrical, and thermal stimulation. From this variety of methods mechanical and thermal tests have emerged as the most useful. Electrical stimuli have presented difficulty regarding the actual nature of the painful stimulus, whether it is to be measured in terms of current, voltage, &c., and until recently chemical stimulation has presented too many technical difficulties.

Hardy et al. (1952) state succinctly the requirements of an adequate method of measuring the pain threshold. Besides using thermal stimulation they have used pressure as a method fulfilling these requirements, modifying Gluzek's (1944) rather cumbersome instrument. They insist on (1) measurability of the stimulus with reproducibility; (2) controllability; (3) adequate range from "threshold" to "ceiling"; (4) the production of minimal damage to tissue; (5) convenience; and (6) the production of clear-cut perception of pain. There is a further necessity, that of simplicity, both as regards the apparatus as it appears to the patient and as regards the application of the test. Though the stimulus must of necessity be "noxious," the apparatus should merit that term as little as possible. From this point of view nothing could be better than the use of the human thumb as in Libman's original test; the simplest modification of which, enabling such a stimulus to be measured, is the pressure algometer (fig. 2).

The Pressure Algometer

This well-established instrument was used as far back as the Victorian days for the assessment of analgesia

Fig. 2—Pressure algometer.

in tabetics. It consists essentially of a metal cylinder containing a spring attached to a plunger on which is fixed a suitable gauge calibrated in kilogrammes (from 0 to 10) to measure the force applied at the tip. The rounded tip of the plunger is 0·5 cm. in diameter.

The instrument is applied perpendicularly to a flat bony surface, usually the forehead, pressure being increased at a standard rate of 1 kg. per sec. (fig. 3). The conditions under which the test is done should be standardised as far as possible to allay any apprehension on the part of the patient. The most suitable environment is the consulting-room, the patient lying with the head comfortably supported on the examination couch, and no third person being present. Neither the procedure nor the instrument should be allowed to convey any impression of threat to the patient. A standardised "patter" is used to introduce the instrument and the procedure to the patient, who, thus instructed, is asked to coöperate and is given trials "to get the feel of it." He is told that he will feel pressure applied; that this will be increased, and as soon as he would describe this pressure as painful he is to say "Now." He is specifically instructed not to let the pressure continue after it has become painful. The test is completed in a few seconds. It is repeated on different areas until consistent readings are obtained on three occasions. The most satisfactory site of application is the forehead, since the flat broad area allows of repetition of the test. Similar results are obtained if Libman's test is more closely imitated by applying the stimulus over the styloid process, but it is less easy to apply a constant stimulus here owing to anatomical factors; hence results are less easily reproducible.

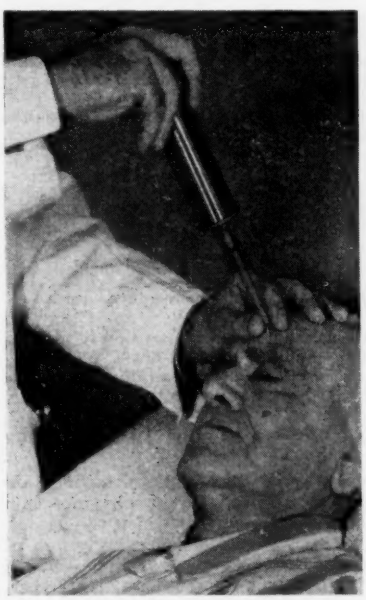

Fig. 3—Method of using pressure algometer.

Should both "threshold" and "ceiling" observations be required, the patient is warned that the pressure will be painful, and is asked to describe the pain experienced as slight, moderate, or severe. The stimulus is then applied and a watch is kept for withdrawal reflexes—e.g., wincing, and narrowing of the eyelids, the commonest reflex motor effect. In many cases the word "Severe" is uttered at the same time as the wincing movement is made. By this test the person's verbal description of pain intensity can be correlated with his involuntary reaction. The test also records the ceiling above which it is impossible to make further measurable observations. This test has, however, the disadvantage of constantly damaging tissue; hyperalgesia of the site may last twenty-four hours or more, and the occasional production of hæmatomata has led to its abandonment as a routine. It is useful in hyposensitive persons, in whom threshold levels may present some difficulty. The site of choice for the test is the forehead, the stimulus being applied on both sides symmetrically. Results are easily compared with those obtained from the styloid process, mastoid process, and manubrium sterni. Over the styloid they are similar to those on the forehead, but the mastoid and sternum are less sensitive.

TABLE I—EFFECT OF OPERATIONS ON TRIGEMINAL NERVE ON PRESSURE-PAIN THRESHOLD ON FOREHEAD

Case no.	Operation	Pain threshold (kg.)	
		Normal side	Treated side
1	Lt. trigeminal neurectomy (motor and sensory)	1·5	6·0+
2	Rt. trigeminal neurectomy (sensory)	0·5	4·0
3	Rt. trigeminal neurectomy (sensory)	2·0	4·0
4	Rt. gasserian ganglion (alcohol injection)	2·0	6·0+

Constant pressure stimulation augments sensation, and a light pressure stimulus becomes painful after a long time. Everyday examples of this are provided by the tight hat-band, or the clip-on earring, which may have to be removed only after some hours' wear. Thus in applying a pressure stimulus the time factor must be standardised, so that the rate of increase is constant. In this case the pressure is applied at a rate of 1 kg. increase per sec. This allows the scale to be ascended to threshold value with a minimum of fatigue to patient and examiner in a few seconds.

The threshold of pain sensation is defined as that pressure at which the sensation of pressure becomes linked with that of pain. If the pressure is further increased, the element of pressure rapidly diminishes, and that of aching pain replaces it.

Calibration of Pressure-pain Test against Gross Local Sensory Change

To obtain information about the order of sensory change reflected in different values of the pain threshold measured with this instrument, comparison was made between the normal and the de-afferented side in 4 patients treated for trigeminal neuralgia (see table I). With sensory trigeminal neurectomy the threshold rose from 0·5 or 2·0 kg. to 4·0 kg.—i.e., pressure-pain sense persisted but was grossly impaired. After combined motor and sensory neurectomy and a remarkably successful alcohol injection pressure pain was abolished (pressures of 6·0–7·0 kg. being the maximum applicable without undue risk of trauma). A difference of 2·0–4·0 kg. in pain threshold is therefore equivalent to the difference in sensation produced by depriving a normal person's forehead of its main sensory nerve-supply.

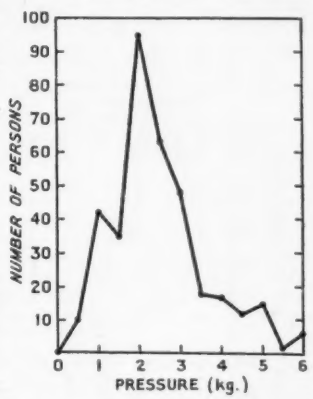

Fig. 4—Pressure-pain thresholds in 363 persons.

Pressure-pain Sensitivity in Normal Persons

Pain-threshold values derived from tests on 363 normal persons are shown in fig. 4. With this method the mean value is 2·0 kg., the range being from 0·5 to 6·0 kg. or more.

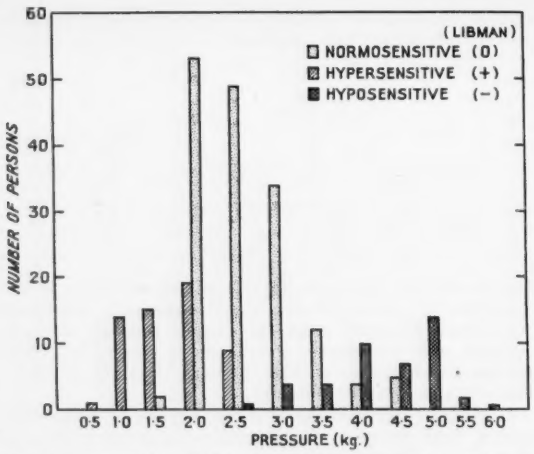

Fig. 5—Pressure-pain sensitivity in 260 persons grouped according to results of Libman's test and pressure algometry.

In 260 persons the Libman test and the pressure-pain test were done independently, individuals being grouped into hyposensitive, normosensitive, and hypersensitive along the lines suggested by Libman. The correlation of these groups with pressure-pain sensitivity is shown in fig. 5, which shows that hypersensitivity predominates up to 1·5 kg., normosensitivity from 2·0 to 4·0 kg., and hyposensitivity at higher values.

Relation between Pressure and Ischæmic Pain Sensitivity

Since both the original Libman test and its quantitative modification involve pressure-pain sensitivity, their significance may be clarified by comparing them with sensitivity to another mode of pain. For this purpose Harrison and Bigelow's (1943) modification of Lewis's (1942) ischæmic test has been used, the original isometric form of work being replaced by isotonic squeezing of a sphygmomanometer bulb at a metronome-rate of 1 per sec., pain threshold being taken as the number of contractions previous to the appearance of slight ischæmic pain in the arm. The range obtained by this method in 100 persons was 18–112, but the test was found unsatisfactory in that 13 persons, particularly the hyposensitive, were stopped by fatigue before pain appeared. Libman's test and pressure algometry were also applied to these persons. The results of a comparison of the three tests are shown in fig. 6, where the result in each case is charted, so that the three tests may be correlated. It will be seen that there is a close relation between the results of the Libman test and those of pressure algometry, probably partly due to the fact that the examiner had acquired by practice some knowledge of the pressure exerted by his thumb in applying the Libman test. The relation between these two tests and the ischæmic test, though less close, is quite clear. For example all but 1 of the Libman hyposensitives correspond to a pressure-algometer value of 4·0 kg. or more and an ischæmic pain value of 50 or more. The rather wide range of values in the ischæmic test probably results from the variable factor of fatigue previously mentioned and other factors which render this test rather unsatisfactory in practice.

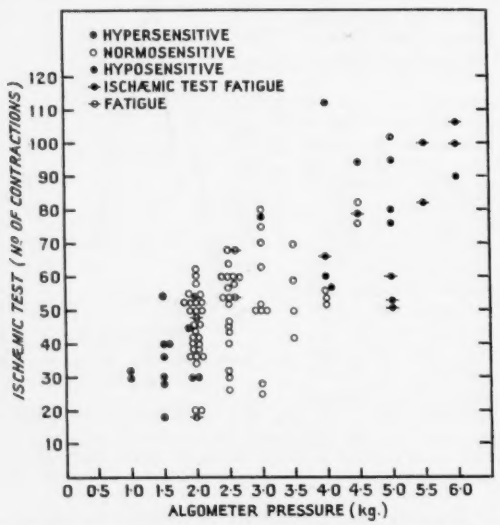

Fig. 6—Distribution of 100 persons each of whom was first graded by Libman's test into normosensitive, hypersensitive, or hyposensitive, and then according to pressure algometry (abscissa) and Lewis's test (ordinates). The last-named method caused end-points by fatigue.

Combined use of these three methods of determining pain threshold gives the following grouping:

Group 1 (hypersensitive) Libman hypersensitive: pressure algometer, less than 2·0 kg.; ischæmic test, less than 40.

TABLE II—DISTRIBUTION OF PAIN SENSITIVITY IN NORMAL PERSONS ASSESSED BY FOUR DIFFERENT METHODS

Test	Normal range	Hyper-sensitive	Normo-sensitive	Hypo-sensitive
Libman's	..	22·3%	61·2%	16·5%
Pressure algometer	2·0–4·0 kg.	23·0%	62·0%	15·0%
Lewis's	30–60	13·0%	62·0%	25·0%
Hollander's ..	110–260 mm. Hg	18·0%	65·0%	17·0%

" Normal range " is that found in " normosensitive " persons.

Group 2 (normosensitive) Libman normosensitive: pressure algometer, 2·0–4·0 kg.; ischæmic test, 30–60.

Group 3 (hyposensitive) Libman hyposensitive: pressure algometer, 4·0–6·0 kg. or more; ischæmic test, 60 or more.

Relation of Hollander's Test to other Pain-sensitivity Tests

In 1939 Hollander described a method of testing pain sensitivity by inserting a grater inside a sphygmomanometer cuff and noting the pressure at which the patient so stimulated began to " wince, change expression, or cry out." Individuals were classified as hyposensitive if they showed no signs of pain at 260 mm. Hg, hypersensitive with pain below 110 mm. Hg, and normosensitive if evincing pain in the range 110–260 mm. Hg. Sherman (1943) has correlated these tests with the Libman test and states that the two closely agree. In 450 normal persons so graded he found 65% normosensitive, 18% hypersensitive, and 17% hyposensitive.

Comparison of the results of this test with the Libman, pressure-algometer, and ischæmic tests gives a distribution among normal persons as shown in table II.

Such a comparison shows that the results obtained from one method may be converted into any of the three others, normal range of values described for each method being used as a basis. By extending this comparative method to other pain-sensitivity procedures an objective meaning can be attached to the commonly used terms " hypersensitive " and " hyposensitive," so long as the basis of reference is made clear.

Summary

The chief defect in Libman's test for pain sensitivity lies in its lack of measurement of the stimulus. This may be overcome by the use of the pressure algometer.

This instrument and the technique of its application are described.

Pressure-pain thresholds in 363 persons were measured, the range being from 0·5 kg. to 6·0 kg., with a mean value of 2·0 kg.

Calibration against the Libman test in 260 persons showed that hyposensitivity appeared at 4·0 kg.

The difference between normosensitivity and hyposensitivity is of the same order as that between the pain sensitivity of the forehead before and after trigeminal neurectomy.

Comparison of Libman's test, the pressure-algometer test, and Lewis's ischæmic test, though this last concerns a different mode of pain, shows a similar grading.

The distribution of the three grades of sensitivity found by Libman's test, pressure algometry, Lewis's test, and Hollander's test among normal persons is compared and shown to be similar. These tests are shown to be equivalent to one another in that their normal values are interconvertible.

The concepts of pain-threshold equivalents, demonstrated for this group of tests, gives an objective value to the terms "hyposensitive" and hypersensitive," which is much needed. It is suggested that, if other pain-sensitivity tests, of which there are many, were expressed in similar equivalent terms, a sounder basis than exists at present would be provided for the study of symptoms.

I wish to thank Mr. John O'Connell for allowing me to examine his cases of trigeminal neuralgia many years ago; and Mr. A. Carr for his photography.

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HYPERCHLORÆMIA IN DIABETIC COMA

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PATIENTS admitted to hospital with diabetic coma or pre-coma are usually dehydrated and have low or normal plasma-chloride levels. Hyperchloræmia is infrequent, but when it occurs it is usually the result of intravenous infusion of solutions, such as isotonic sodium chloride, which have a chloride concentration greater than that of extracellular fluid (Sprague and Power 1953). Hyperchloræmia may, however, develop in diabetic coma without the administration of chloride-containing fluids (Fullerton et al. 1932, McCance and Lawrence 1935).

Since, rightly or wrongly, the plasma-chloride level is often used as one of the guides to fluid and electrolyte requirements in diabetic coma, it may be important to interpret correctly a high value. The various causes of hyperchloræmia are therefore considered here and illustrated by the case-records of 10 patients admitted since 1946 to the Radcliffe Infirmary in diabetic coma with plasma-chloride levels exceeding 106 m.eq. per litre.

Case-reports

Hyperchloræmia developed in cases 1 and 2 although neither had received chloride ion during the early period of rehydration.

Case 1.—A woman, aged 72, was admitted to hospital in diabetic pre-coma with a blood-sugar level of 500 mg. per 100 ml. and a blood-pressure of 130/80 mm. Hg. She had had an upper respiratory infection with slight fever for four days. She appeared to be "only slightly dehydrated." She was treated with insulin injections and water by mouth. After ten hours 2250 ml. of water had been given but no sodium chloride, and the blood-sugar level was 111 mg. per 100 ml., the blood-urea level 150 mg. per 100 ml., the plasma-chloride level 112 m.eq. per litre, and the plasma-bicarbonate level 26 m.eq. per litre. During this time 390 ml. of urine was collected, and the patient was also incontinent on two occasions. There was no proteinuria. After twenty-four hours her temperature rose suddenly to 103°F, right upper-lobe pneumonia was diagnosed, and penicillin was given; but she died forty-eight hours after admission. At necropsy there was a right upper-lobe pneumonia and the kidneys showed early changes of Kimmelstiel-Wilson disease.

Case 2.—A man, aged 68, became increasingly drowsy for five days and was admitted in diabetic coma with a blood-sugar level of 690 mg. per 100 ml. and a blood-pressure of 110/80 mm. Hg. During the first six hours he received, besides insulin, 750 ml. of milk and water by mouth and 1000 ml. of water by rectum, but passed only 80 ml. of urine. His blood-sugar level at the end of six hours was 380 mg. per 100 ml., his plasma-chloride level 125 m.eq. per litre, and his plasma-bicarbonate level 21 m.eq. per litre. His blood-pressure had by then fallen to 80/60 mm. Hg, and an intravenous saline transfusion was set up. Despite this the blood-pressure fell further and the patient died in peripheral circulatory failure nine hours after admission. Necropsy showed vomit in the larynx and trachea and passive congestion of both lungs. The kidneys were rather soft but of normal weight; their capsules stripped easily, and there was no evidence of gross renal disease.

Since neither case 1 nor case 2 had received significant amounts of chloride ion, hyperchloræmia must have arisen from concentration of chloride already present in the body-fluids. Such a concentration would arise if there had been a proportionately greater loss of water than of chloride from the extracellular fluid during the onset of coma or during treatment, with the result that water depletion would exist and overshadow any existing salt depletion.

In five patients (cases 3–7) hyperchloræmia may be attributed to their receiving a relative excess of chloride ion during the initial period of rehydration. Cases 3 and 4 resemble the cases reported by Sprague and Power (1953) in having received intravenous infusions of solutions containing chloride ion in greater concentration than in extracellular fluids.

Case 3.—A man, aged 24, was admitted in diabetic coma with a blood-sugar level of 470 mg. per 100 ml. Two hours after the administration of insulin the blood-sugar level was 440 mg. per 100 ml., the blood-urea level 38 mg. per 100 ml., the plasma-chloride level 113 m.eq. per litre, and the plasma-bicarbonate level 8 m.eq. per litre. During this period the patient was given 560 ml. of isotonic saline solution by vein and a similar amount by mouth, and thus received 170 m.eq. of chloride ion in 1120 ml. of fluid. He was given no further sodium chloride intravenously and made an uneventful recovery.

Case 4.—A severely dehydrated woman, aged 22, was admitted in diabetic coma with a blood-sugar level of 615 mg. per 100 ml. She was given insulin and intravenous and oral fluids, and after sixteen hours had received 5680 ml. of isotonic sodium chloride (860 m.eq. chloride ion) by vein, and 250 ml. of isotonic sodium chloride and 1600 ml. of water by mouth, and had passed 3980 ml. of urine. The plasma-chloride level was then 110 m.eq. per litre and the plasma-bicarbonate level 12 m.eq. per litre, and the blood-sugar level had fallen to 116 mg. per 100 ml. The patient had thus received about 900 m.eq. of chloride in 7500 ml. of fluid. On admission the urine contained no chloride ion, but eight hours later the urinary chloride had increased to 43 m.eq. per litre, and sixteen hours after admission to 51 m.eq. per litre. The blood-pressure on admission was 140/95 mm. Hg and subsequently it did not fall below 110/60 mm. Hg. The patient made an uneventful recovery.

It is clear that in case 4 the kidneys eliminated excess chloride from the body fairly rapidly.

In cases 5, 6, and 7 the plasma-chloride levels rose although chloride ion was given in hypotonic concentrations, and in 2 cases only by mouth.

Case 5.—A woman, aged 57, was admitted in diabetic coma with a blood-sugar level of 798 mg. per 100 ml. After two hours she had received 790 ml. of isotonic saline solution (119 m.eq.) by vein, and the plasma-chloride level was 107 m.eq. per litre and the plasma-bicarbonate level 6 m.eq. per litre. During the next seventeen hours a further 330 ml. of intravenous isotonic sodium chloride, and 2360 ml. of fluid by mouth containing about 120 m.eq. of chloride ion, were given. The plasma-chloride level was now 117 m.eq. per litre, and the plasma-bicarbonate level 23 m.eq. per litre. Thus about 170 m.eq. of chloride ion had been given in 2700 ml. of fluid while the plasma-chloride level rose from 107 to 117 m.eq. per litre. The urinary output in nineteen hours was 1820 ml. During the next twenty-four hours the patient received about 4000 ml. of milk and water, and the plasma-chloride level fell to 103 m.eq. per litre. She made an uneventful recovery.

Case 6.—A man, aged 85, was admitted in diabetic pre-coma with a blood-sugar level of 816 mg. per 100 ml., a blood-urea level of 116 mg. per 100 ml., a plasma-chloride level of 105 m.eq. per litre, and a plasma-bicarbonate level of 16 m.eq. per litre. After sixteen hours' treatment with insulin and oral fluids the blood-sugar level had fallen to 80 mg. per 100 ml., but the plasma-chloride level had risen to 117 m.eq. per litre. The fluid intake during this period was 3640 ml. containing 222 m.eq. of sodium chloride. The urinary output was 1080 ml. After a further twenty-four hours, in which the oral fluid intake totalled 5300 ml., the plasma-chloride level fell to 105 m.eq. per litre. The patient died next day with sudden pyrexia (103°F), and necropsy showed a liver abscess 10 cm. in diameter and normal kidneys.

Case 7.—A woman, aged 66, was admitted in diabetic pre-coma with a blood-sugar level of 555 mg. per 100 ml. Her urine then contained only a little sodium and chloride, 11 and 9 m.eq. per litre respectively. After thirteen hours the plasma-chloride level was 108 m.eq. per litre, and the blood-sugar level had fallen to 85 mg. per 100 ml. The patient had received by mouth about 3800 ml. of fluid containing 170 m.eq. of sodium chloride and had passed 1950 ml. of urine. A specimen of urine obtained fifteen hours after admission contained sodium 23 m.eq. per litre and chloride 77 m.eq. per litre. The patient made an uneventful recovery.

It seems likely that in cases 5–7 loss of water by formation of urine, by evaporation from skin and lungs, and by movement into the cells concentrated chloride ion in the extracellular spaces, with the result that, although given in hypotonic concentration, the chloride received during the initial period of rehydration was relatively in excess of the body's requirements at that time. In these circumstances the kidneys would attempt to eliminate the excess chloride, as was found in case 7. Urinary chloride analyses are unfortunately unavailable for cases 5 and 6.

In the remaining 3 cases hyperchlorræmia was associated with disturbance of renal function:

Case 8.—A woman, aged 68, was admitted in diabetic pre-coma with a blood-sugar level of 600 mg. per 100 ml. and a blood-pressure of 120/65 mm. Hg. She had complained of thirst and frequency of micturition for three weeks, and had become drowsy two days before admission. During the next eighteen hours she received 3400 ml. of fluid by mouth containing 103 m.eq. of sodium chloride, and at the end of this time the plasma-chloride level was 109 m.eq. per litre, the plasma-bicarbonate level 17 m.eq. per litre, and the blood-urea level 225 mg. per 100 ml. The blood-sugar level had fallen to 183 mg. per 100 ml. as a result of insulin therapy. The output of urine during this period was 2160 ml.; but, despite the raised plasma-chloride level, the urinary chloride concentration was only 25 m.eq. per litre. There was slight proteinuria. On the second day the patient collapsed and died. At necropsy the kidneys were found to be enlarged, each weighing 300 g. and showing acute pyelonephritis with considerable papillary necrosis.

Case 9.—A man, aged 75, with prostatic hypertrophy and retention of urine, was admitted in diabetic coma with a blood-sugar level of 920 mg. per 100 ml., a blood-pressure of 130/80 mm. Hg, and distension of the urinary bladder to the level of the umbilicus. Two hours after admission the patient had received 120 m.eq. of sodium chloride in 1100 ml. of water intravenously, and the plasma-chloride level was 116 m.eq. per litre, the plasma-bicarbonate level 15 m.eq. per litre, the blood-urea level 90 mg. per 100 ml., and the blood-sugar level 700 mg. per 100 ml. During the next eleven hours the patient received a further 254 m.eq. of sodium chloride and 1850 ml. of fluid intravenously and 510 ml. of fluid by mouth. The plasma-chloride level had by then risen to 120 m.eq. per litre, and the blood-urea level to 105 mg. per 100 ml., but the blood-sugar level had fallen to 350 mg. per 100 ml. Numerous attempts were made to catheterise the urethra, but adequate drainage of the bladder was not achieved. Only small amounts of urine were obtained, about 200 ml. in thirteen hours. There was no proteinuria. The patient died thirty-five hours after admission. No necropsy was done.

Case 10.—A woman, aged 36, who was twenty-four weeks pregnant, was admitted in diabetic coma with a blood-sugar level of 714 mg. per 100 ml. after an attack of abdominal pain with vomiting. Eight weeks before admission she had had acute pyelitis. On admission there was profound dehydration, and the blood-pressure was 90/50 mm. Hg. An hour after admission the plasma-chloride level was 103 m.eq. per litre, the plasma-bicarbonate level 4 m.eq. per litre, and the blood-urea level 94 mg. per 100 ml. Treatment with insulin and rehydration with oral and intravenous fluids lowered the blood-sugar level to 130 mg. per 100 ml. by the end of forty-eight hours, and raised the blood-pressure to 110/70 mm. Hg. On the third day, however, the patient aborted and was given further transfusions of blood and saline solution to maintain her blood-pressure. The urinary output during the first two days was low, averaging 500 ml., and this was probably related to the low blood-pressure. On the third day, when the systolic blood-pressure was maintained at about 100 mm. Hg, 740 ml. of urine was passed, and on the fourth and fifth days 1450 ml. and 960 ml. respectively. On the fourth day, seventy hours after admission, the plasma-chloride level was 121 m.eq. per litre. The urinary chloride concentration was, however, only 15 m.eq. per litre, despite this high plasma-chloride level. From the time of admission the combined oral and intravenous fluid intake had totalled about 13,000 ml. and had contained 770 m.eq. of sodium chloride. On the fifth day the patient collapsed and died in peripheral circulatory failure. The plasma-chloride level had risen four hours before death to 125 m.eq. per litre, yet the urinary chloride concentration had remained low at 14 m.eq. per litre. At necropsy severe œdema of the lungs and interstitial œdema of the heart, liver, and kidneys were found. The kidneys were otherwise macroscopically and microscopically normal.

These cases illustrate the effect of renal dysfunction on the plasma-chloride level in diabetic coma. In each patient inability to excrete the chloride ion administered during treatment produced hyperchlorræmia. In case 9 the chloride retention was "post-renal," being caused by urethral obstruction to urinary outflow. In cases 8 and 10, however, the kidneys could not excrete enough chloride ion despite high plasma-chloride levels and good urinary volumes. In case 8 this inability to concentrate chloride ion was accompanied by severe renal damage, but in case 10 the inability was present although the kidneys were macroscopically and microscopically normal.

Discussion

INTERPRETATION OF HIGH PLASMA-CHLORIDE LEVELS

The work of several investigators (Atchley et al. 1933, Peters et al. 1933, Kydd 1933, Butler et al. 1947, Nabarro et al. 1952) has established that during the onset of diabetic coma the patient, if unable to swallow, loses water through excessive secretion of urine and by evaporation from the skin and lungs. Sodium and chloride are also lost in the urine initially, with the result that in the uncomplicated case there is a deficiency of both water and salt, with contraction of intracellular and extracellular fluid spaces. If the patient vomits, further sodium and chloride are lost. If, while going into

coma, the patient can maintain the oral intake of fluids to some extent, the deficiency of water may be partly replenished and the patient become mainly salt-deficient. For these reasons the plasma-sodium and plasma-chloride levels in diabetic coma are usually normal or low on admission to hospital, and as a secondary result of this the urinary concentrations of sodium and chloride also become low.

When treatment begins, the loss of water from kidneys, skin, and lungs continues. There is also a shift of water from extracellular fluid to cells as glucose enters the cells under the influence of insulin. These factors tend to concentrate the extracellular fluid and thus to raise the plasma sodium and chloride levels. The plasma-chloride level usually rises more than the plasma-sodium level, because the sodium ion can more readily enter cells. A raised plasma-chloride level may therefore be an early indication of the relative need for water. When isotonic sodium chloride is infused intravenously at this stage to expand the contracting extracellular volume, the plasma-chloride level may become considerably higher than normal, as many investigators have noted.

Hyperchloræmia in cases 3 and 4 arose from such a chain of events. Hypotonic or even oral sodium chloride may similarly produce hyperchloræmia, as illustrated by cases 5, 6, and 7, where the amounts of water given must still have been insufficient for the patient's needs. Cases 1 and 2 show that, even without chloride administration, hyperchloræmia may sometimes develop, although this must be rare. Nabarro et al. (1952), however, mention, without giving clinical details, severe cases of diabetic coma in which plasma-sodium and plasma-chloride levels were raised. They likewise consider that "this results from the patients becoming too drowsy to take fluids by mouth while continuing to lose water in the urine and through hyperpnœa."

If there is normal renal function when hyperchloræmia develops, the urinary chloride concentration increases, as illustrated by cases 4 and 7, in an attempt to restore the plasma-chloride level to normal. If renal function is disturbed, however, as in cases 8–10, the plasma-chloride level may rise further. The inability to excrete chloride in diabetic coma, as in case 10, despite profound hyperchloræmia and no apparent renal disease, has been previously described by Fullerton et al. (1932), McCance and Lawrence (1935), and McCance and Widdowson (1939). It has also been described in head injury and in other conditions (see Higgins et al. 1951, Taylor 1951, for summary of published reports) and seems to be rare but well authenticated. Its occurrence may lead to retention of administered salt as œdema fluid, as it did in case 10.

The development of hyperchloræmia in diabetic coma may therefore merely reflect the infusion of solutions containing chloride ion in greater concentration than in plasma, or may indicate that a relative need for water is arising, or may indicate a defective renal excretion of chloride. Knowledge of what fluids have been given, together with urinary chloride estimations, will determine which of these factors is at work. If there is renal dysfunction, the cause may be intrinsic renal damage, pre- or post-renal oliguria, or the hyperchloræmic-hypochloruric syndrome.

TREATMENT OF HYPERCHLORÆMIA

When hyperchloræmia is caused by renal inability to excrete chloride, the administration of sodium chloride should cease until the ability to excrete chloride ion returns. Otherwise the sodium and chloride levels may rise further, or œdema may develop. A good water intake should be maintained unless there is also oliguria. These measures have been successful in treating hyperchloræmic-hypochloruric states in head injury (Higgins et al. 1953).

Where renal function is normal, the problem of whether hyperchloræmia is harmful, and should or should not be treated or prevented, has caused some speculation. The principal metabolic effect of hyperchloræmia is the displacement of bicarbonate, and it may therefore possibly prolong the acidosis and hyperpnœa. Kydd (1933) found that, although the plasma-bicarbonate level may remain low in hyperchloræmia, visible hyperpnœa does not persist. Danowski et al. (1949) found that the development of hyperchloræmia did not usually prevent the return of the plasma-bicarbonate level to normal, but that in 1 patient at least "the possibility that hyperchloræmia prolonged the acidosis . . . can by no means be excluded." Sprague and Power (1953) describe a patient in whom hyperchloræmia depressed the serum-bicarbonate level, and point out that there is evidence (Mackler et al. 1951) that chloride acidosis may interfere with the action of insulin. Of the 10 present cases the plasma-bicarbonate levels at the time of hyperchloræmia were within normal limits in 4 and low in 6. In case 10, who showed the hyperchloræmic-hypochloruric syndrome, the plasma-bicarbonate level remained depressed for five days, despite the administration of adequate doses of insulin, the almost complete disappearance of ketone bodies from the urine, and the administration of sodium bicarbonate. When first estimated, the plasma-bicarbonate level was 4 m.eq. per litre; on the second day it rose to 11 m.eq. per litre; on the fourth day it fell again to 4 m.eq. per litre; and on the fifth day it rose to 18 m.eq. per litre. Hyperpnœa persisted throughout the illness; but, because of the retention of chloride, there was considerable pulmonary œdema, which may have contributed to the hyperpnœa. Nevertheless it is possible that in this patient hyperchloræmia was a factor in maintaining acidosis.

Because of this possibility it seems desirable to prevent hyperchloræmia in diabetic coma; but against this must be balanced the imperative need to increase the volume of the extracellular fluid in the early stages of treatment, especially if there has been vomiting. Sprague and Power (1953) have resolved the difficulty by giving sodium-chloride-lactate or sodium-chloride-bicarbonate solutions which contain chloride in a concentration of only 100 m.eq. per litre. This has led in their hands to a considerable reduction of hyperchloræmia during treatment but has not completely eliminated it. Since the fundamental cause of hyperchloræmia is a relative lack of water, it could be completely eliminated by giving at some stage water without sodium chloride. The possibility of simultaneously using the oral route for this purpose should not be forgotten; but, if intravenous therapy alone is possible, the solutions recommended by Nabarro et al. (1952) seem to be most satisfactory. These workers have summarised the disadvantages, in the early stages of treatment, of the alternative of giving water in the form of isotonic glucose solutions intravenously. Until it becomes possible to assess accurately before treatment the individual salt and water deficits of patients with diabetic coma, it will remain difficult to avoid giving an excess of one or other substance, because rehydration cannot be delayed until biochemical investigations are completed. In these circumstances estimations of plasma-chloride levels may be useful as guides to the further course of fluid replacement, provided that difficulties in interpreting high values are appreciated.

Summary

Hyperchloræmia is described in 10 cases of diabetic pre-coma or coma.

Hyperchloræmia may result from intravenous infusion of solutions containing chloride in greater concentration than in extracellular fluids, from relative water deficiency, or from inability to excrete chloride ion.

Inability to excrete chloride ion may arise from renal disease, from pre- or post-renal oliguria, or from a hyperchloræmic-hypochloruric syndrome in which there is no histological evidence of renal damage.

The plasma-chloride level may be a useful guide to fluid therapy in diabetic coma, provided that, when hyperchloræmia develops, its several possible causes are appreciated.

I wish to thank the physicians of the Radcliffe Infirmary for access to patients under their care, and the staff of the department of clinical biochemistry for making many of the biochemical analyses. I am especially grateful to Dr. A. H. T. Robb-Smith for permission to cite the necropsy findings and for examining histological sections, and to Dr. A. M. Cooke and Mr. J. R. P. O'Brien for advice and help with the manuscript.

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BIRTH WEIGHTS OF CHILDREN WITH CEREBRAL PALSY

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IN a previous investigation (Evans 1948), undertaken in the hope that it would disclose new lines for research into the causes of infantile cerebral palsy, it was noted that the curve of the distribution of birth weights of children with spastic paraplegia or diplegia had a double peak. This suggested that there might be two groups of cases which differed in other respects besides birth weight; but no conclusions were reached, because the series was small and the uneven distribution might have been due to chance variation.

Since then further patients have been seen, and the increase in numbers makes it worth while to re-examine the problem. While doing this we have also reconsidered the birth weights of children with athetoid cerebral palsy, which were found previously to have an abnormal distribution curve although it did not show a double peak, and have included a series of cases of infantile hemiplegia, of which there were too few to merit attention in the earlier paper.

Selection of Cases

All the patients were examined by one observer (P. R. E.), whose diagnostic criteria have probably not altered significantly during the period of observation. Most of the children were seen on more than one occasion; some were followed for several years. They were seen in hospital and private practice; some of the earlier, but none of the additional, patients were seen at St. Margaret's School for Children with Cerebral Palsy, at Croydon, where there was a high proportion of athetoid cases. The numbers of cases of different types are shown in table I. To obtain clinically distinct groups, cases in which the diagnosis was in doubt were omitted; so also were cases with mixed types of motor disorder (e.g., spastic paraplegia with athetosis of the upper extremities) and cases in which there was insufficient information (e.g., birth weight not known). As we were interested in weight at birth—i.e., in antenatal and natal conditions—cases in which there was an obvious postnatal cause or onset were also omitted (e.g., hemiplegia developing during an acute infectious fever, and athetoid cerebral palsy following icterus gravis neonatorum).

TABLE I—NUMBERS OF CASES

Diagnosis	Original series (Evans 1948)	Additional cases	Total
Spastic diplegia and paraplegia	36	40	76
Athetosis	37	15	52
Hemiplegia	10	26	36

Cases in which double hemiplegia seemed a more appropriate diagnosis than spastic diplegia were omitted, and all patients suffering from the latter condition were equally or nearly equally affected on each side. Spastic paraplegia shades over into diplegia; and, because patients were seen in practice and not for research purposes, division into the two groups was based as much on function (because it is so closely related to treatment) as on neurological examination. If there was no indubitable spasticity in the upper extremities, and if the hands were used normally for the age and intelligence of the child, a diagnosis of paraplegia was made. Consequently the paraplegic group may have included a few cases of mild diplegia, while all those labelled diplegic were so.

In the group of athetoid cases we have included patients with free and uninhibited involuntary movements, as well as those who showed athetoid movements and postures with, in addition, inconstant rigidity but not consistent spasticity of any muscle group. At a later date it may be worth while to try to separate these two varieties, but it has not been done here.

Except in slightly affected cases seen in infancy the diagnosis of hemiplegia is easy and needs no further comment.

We have tried to assess approximately the intelligence of these patients. In some cases psychologists with experience of cerebral palsy examined and re-examined the children and were able to estimate the intelligence quotient, but in most cases assessment depended on the clinical observations of the physician, often assisted by knowledge of the response to treatment and, in some cases, to education at school. The development of speech (vocabulary and construction of sentences rather than diction) was often a useful point. These patients were seen in ordinary practice, with the question "Is the child educable?" always in mind. Consequently the children were divided into those who were certainly so mentally

TABLE II—MEAN WEIGHT AND STANDARD DEVIATION FOR SURVIVORS AND NON-SURVIVORS (AFTER KARN AND PENROSE 1951)

(The data have been combined to include both sexes)

—	Mean weight (lb.)	Standard deviation
Survivors	7·24 ± 0·01	1·14
Non-survivors	5·48 ± 0·13	2·32

* In receipt of a grant from the Commonwealth Fund.

defective as to be ineducable, those who probably were or would be educable, and a small intermediate group in which the question could not then be answered, mainly because the physical disability was so severe that the intelligence could be only doubtfully guessed. Crude and unsatisfactory in many respects though these estimates were, they were usually good enough to be of practical use.

Birth weights were obtained by asking mothers; and, in rather more than half the cases, hospital or nursing-home records were consulted in confirmation. Fraser Roberts and Asher (1949) found that questioning mothers was not inferior to consulting hospital records as a means of discovering birth weight.

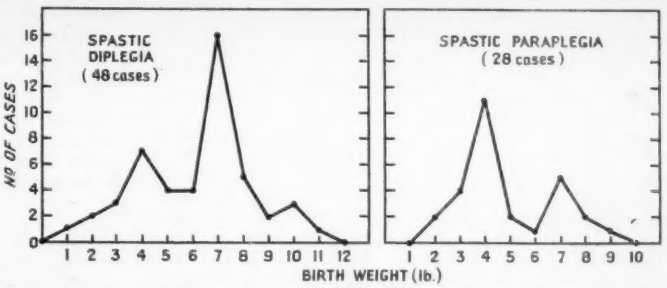

Fig. 1—Frequency distributions of birth weights of 48 spastic diplegics and 29 spastic paraplegics.

If birth weight may be considered as a reflection of the maternal-fœtal relationship, it might be assumed that distributions of birth weights for any particular abnormality might have some bearing on ætiology. Information on the variability of this measurement in a large sample has been given by Karn et al. (1951) and Karn and Penrose (1951), who studied the distribution of weights of 13,730 infants born at University College Hospital in twelve years. Of these, 13,116 lived more than twenty-eight days, and 614 were either stillborn or died in the first four weeks of life. Mean weights and standard deviations for each sex were calculated for these two groups, and these values, adjusted to include both sexes, are set out in table II. In addition, by determining the ratio of the logarithms of the numbers of non-survivors to survivors in successive weight-groups increasing by 1 lb., and fitting a parabola to the results, they determined that the lowest mortality—i.e., the optimum weight for survival—for both sexes together was at 7·97 lb. It was also seen that, when mortality was determined for each weight-group, it was lowest among those weighing from 7·50 to 8·49 lb. at birth.

TABLE III—MEAN AND STANDARD DEVIATION OF BIRTH WEIGHTS OF CHILDREN WITH CEREBRAL PALSY NOT DUE TO ANY OBVIOUS POSTNATAL CAUSE

Type	Mean weight (lb.)	Standard deviation
Diplegic	5·97 ± 0·37	2·56
Paraplegic	4·73 ± 0·37	1·97
Diplegic plus paraplegic	5·54 ± 0·26	2·34
Athetoid	6·19 ± 0·36	2·65
Hemiplegic	6·67 ± 0·38	1·51

We examined frequency distributions of birth weights of three classes of cerebral palsy in the light of the above information.

Spastic Paraplegia and Diplegia

The mean weights and standard deviations of 28 paraplegics and 48 diplegics separately and together are set out in table III. No statistical treatment is required to show that these values differ significantly from those of the distribution of survivors of Karn and Penrose (1951). On the other hand, it is interesting to see how closely the figures agree with those of the distribution of non-survivors (table II).

If the causes of normal variation in birth weight, whether genetical or environmental, are reflected in the variance of the distribution of survivors, one might suppose that a single condition associated with some alteration of birth weight would perhaps change the mean but not the variance. If, on the other hand, there were several causes of a condition associated with alteration of birth weight, one might expect not only changes in the mean weight but also, even more probably, changes in the variance or in some other parameter. The variance of the distribution of paraplegics is about three times that of the Karn and Penrose survivors, and that of the diplegics about five times the variance of the survivors. This very large dispersion of the weights of the spastics suggests ætiological heterogeneity.

Frequency distributions of the two types are set out in fig. 1. The most striking feature of the two curves is their bimodality. The numbers are rather small to test for significance, but the probability that the bimodality of the distribution of diplegics is real is about 0·05. The number of paraplegics is too small to give a significant test.

It is seen that most diplegics weigh more than 6 lb. at birth, though some weigh less, and that most paraplegics weigh less than 6 lb. at birth, though some weigh more. Bimodalities in biological distributions usually reflect significant differences in the characteristics of the individuals contributing to the two modes. In this case it seems reasonable to say that not only the two conditions are different but also the causes of each are probably different in the two weight-groups.

A further evidence of heterogeneity appears on analysis of the mentality of the two groups. In table IV the data are set out according to diagnosis and according to weight, the dividing line being $5^1/_2$ lb., the usual criterion of prematurity. In addition χ^2 estimations have been made which indicate that the differences are not likely to be due to chance. Thus it appears that the large babies, regardless of the diagnosis, are more likely to be grossly defective; in other words, the diplegics are more likely to be defective and the paraplegics to be more nearly normal.

Removal of twins from the series did not materially alter either means or standard deviations of the birth weights, although the very high incidence of twinning (6 diplegics and 2 paraplegics in a total of 76 patients) is notable. In no case were the twins known to be uniovular (in two instances at least they were of different sex). Whereas the patients had spastic paralysis, their twins suffered even more severely for they were "non-survivors": 4 were stillborn, 3 died within twenty-four hours of birth, and the remaining 1 died at the age of a month. Twins often die, either because of obstetric complications or because they are small and immature, but such a consistent combination of paralysis of one

TABLE IV—NUMBERS OF CHILDREN THOUGHT TO BE SEVERELY MENTALLY DEFECTIVE COMPARED WITH THOSE THOUGHT TO BE EDUCABLE

Category	Defective	Educable	χ^2	P
Diplegia	29	17	13·60	<0·001
Paraplegia ..	5	22		
Birth weight:				
More than $5^1/_2$ lb.	27	12	17·38	<0·001
$5^1/_2$ lb. or less ..	7	27		

TABLE V—BIRTH WEIGHTS

Weight (lb.)	Spastic diplegia	Spastic paraplegia	Diplegia plus paraplegia	Hemiplegia	Athetoid
0·5– 1·49..	1	..	1	..	..
1·5– 2·49..	2	2	4	..	1
2·5– 3·49..	3	4	7	..	2
3·5– 4·49..	7	11	18	2	4
4·5– 5·49..	4	2	6	6	6
5·5– 6·49..	4	1	5	7	10
6·5– 7·49..	16	5	21	11	16
7·5– 8·49..	5	2	7	5	7
8·5– 9·49..	2	1	3	4	4
9·5–10·49..	3	..	3	1	1
10·5–11·49..	1	..	1	..	1
11·5–12·49..	..	..	..	..	..
Total ..	48	28	76	36	52

twin and death of the other suggests that noxious influences were active towards the end of intra-uterine life (3 of the 4 stillborn children were macerated); the frequent occurrence of premature birth in spastic cases has perhaps a similar implication.

It seemed worth while to find out the point in the distribution of birth weight at which a baby is least likely to be spastic. This could be done by a method of Penrose (1947), in which one calculates the point of maximal discrimination, or least misclassification, between two overlapping and more or less Gaussian curves. The formula is as follows:

$$\text{Optimum weight} = \frac{m_1v_2 - m_2v_1}{v_2 - v_1}$$

where m_1 and m_2 are the two means, and v_1 and v_2 are the two variances or squares of the standard deviations. The optimum weight (m_1 and v_1 being respectively the mean and variance of the survivor distribution of Karn and Penrose, and m_2 and v_2 the means and variances of the paraplegics and diplegics) for escaping spastic diplegia is 7·56 lb.; for escaping paraplegia 8·43 lb.; for both combined 7·77 lb. All three figures fall into the 7·50–8·49 lb. range, and it will be remembered that the optimum weight for survival was about 8 lb. Thus the survival advantage of being born in this weight range may be extended to an advantage which allows the escape from spastic diplegia and paraplegia. What this advantage might be is not at all clear, though one knows that obstetrical and neonatal problems associated with very large babies are different from those associated with the small ones.

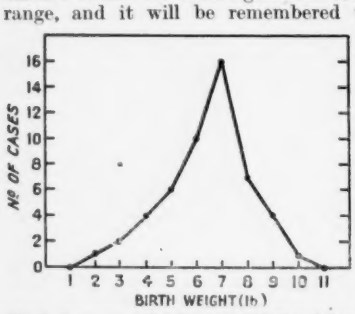

Fig. 2—Frequency distribution of birth weights of 52 athetoids.

Athetoid Cerebral Palsy

The mean weights in 52 cases of athetoid cerebral palsy, exclusive of any associated with erythroblastosis, are set out in table v, and the frequency distribution is shown in fig. 2. It may be seen that there is a rather high proportion of very small babies as well as very large. Indeed the variance is more than five times that of the survivors. Thus, as in the case of the spastics, the large dispersion suggests ætiological heterogeneity. Calculation of the weight of maximal discrimination between athetoids and survivors produces a result of 7·74 lb., which is evidence that causes differ in the large and small weight-groups.

Hemiplegia

This group consists of 36 cases of hemiplegia in which every effort was made to eliminate those whose onset was associated with any clear-cut abnormality such as hydrocephalus or any postnatal illness. The mean weight and S.D. are set out in table III, and the frequency distribution in fig. 3. It will be seen that the mean weight and dispersion do not differ much from those of the survivors of Karn and Penrose. Calculation of the point of maximal discrimination gives a result of 7·98 lb. Here again there is relative sparing of babies born in the 8 lb. range.

Discussion

Analysis of this type thus lends support to what is already supposed: that each of the types of cerebral palsy may have a variety of causes, and that the causes probably differ in babies born after differing periods of gestation, and in the different weight-groups. The problem remains one of sorting out homogeneous ætiological groups from the heterogeneous ones. This has been done to some extent in what we know of the association of erythroblastosis with athetosis, and of the association of neurological sequelæ with severe intracranial damage following difficult labour or following postnatal disease. But all too often the ætiology is not clear. Further analysis according to birth-weight groups might help.

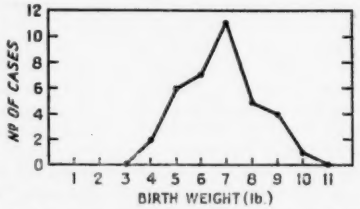

Fig. 3—Frequency distribution of birth weights of 36 hemiplegics.

Birth weight is a graded metrical characteristic similar to stature. As in stature, there is a background of variation which is in part genetical and in part due to environmental causes. It seems reasonable to suppose that, as in stature, the greater the departure from the mean the greater is the variety of physiological abnormality and the larger the number of causes of the abnormalities. Thus in the case of stature there are many different causes of dwarfism, and in most cases clinical differences are clearly associated with the cause. In the case of the distribution of the weights of the non-survivors in the data of Karn and Penrose (1951) there is a considerable variance, and the causes of death of the small babies are certainly not the same as those leading to the death of the large babies. Babies weighing 9 lb. or more at birth are likely to be in later developmental stages than are babies weighing 1–5 lb. One noxious influence may produce injuries whose varying manifestations depend on the developmental stage of the fœtus; or, conversely, quite distinct influences may operate in separate developmental stages in such a way as to produce the same clinical picture by different mechanisms. Furthermore, the obstetrical problems will vary according to weight. The fact that in each type of case reviewed here there were fewer babies than expected in the 7·50–8·49 lb. weight-group argues in this direction.

Thus one might study the cases according to birth weight. We have seen that in the spastic cases there is a division into weight-groups, shown by a bimodal distribution and a large variance. There is also an association of gross mental defect or relatively normal mentality with weight. Might not a small intelligent diplegic be the product of an influence other than that instrumental in the production of a small microcephalic one, and each of these differ in ætiology from the larger ones? This kind of analysis would require much larger numbers than are here given, but the characterisation of what appear to be homogeneous groups might easily point the way to further understanding of the abnormal physiology involved.

Summary

Distributions of birth weight were analysed in three classes of cerebral palsy: (1) spastic, including diplegia and paraplegia; (2) athetoid; and (3) hemiplegic. In each group those cases with known or obvious ætiology were excluded.

The distributions of paraplegics and diplegics differed significantly in mean and variance from a distribution of normals. Both curves were bimodal, and the bulk of the diplegics were in the normal weight-range, whereas most of the paraplegics were small. The paraplegics were more likely to be of normal intelligence, and the diplegics to be defective; but this difference held equally for small babies opposed to large, regardless of the diagnosis. Some association of these conditions with twinning was indicated. Compared with the distribution of birth weights of infants who survived the first month of life, there was a deficiency of spastic cases of both types in the 7·50–8·49 lb. range.

In athetoid cases the distribution differed significantly in mean from that of the "survivors," but even more so in variance, the latter being more than five times that of the survivors. Here again the optimum weight for escaping athetosis fell in the 7·50–8·49 lb. range.

In hemiplegic cases the distribution did not differ much in mean or variance from that of the survivors, but once more the optimum weight was in the range of 7·50–8·49 lb.

In the aggregate, babies weighing about 8 lb. at birth are more likely to survive than lighter or heavier infants, and are less likely to have spastic paraplegia, spastic diplegia, athetoid cerebral palsy not due to kernicterus, or congenital hemiplegia.

It is a pleasure to acknowledge the help and advice given in this investigation by Prof. L. S. Penrose, F.R.S.

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SPECIFICITY OF CORTISONE AND HYDROCORTISONE IN DEPRESSING SENSITIVITY TO TUBERCULIN IN GUINEAPIGS

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CORTICOTROPHIN or cortisone acetate, injected into guineapigs infected with B.C.G. depresses sensitivity to tuberculin by a significant though limited amount (Long and Miles 1950).

In this paper we show that (among the steroids) cortisone, hydrocortisone, and their respective 21-mono-acetates are specific in this respect; that alteration in the functional units of these compounds causes loss of desensitising potency; and that even the addition of a second acetate molecule to form cortisone diacetate renders the drug inactive. Under the conditions of the test no difference in desensitising potency could be detected between cortisone, hydrocortisone, and their mono-acetates. The pharmacological implications of the findings are discussed.

Methods

Albino guineapigs of the Hampstead strain, weighing 350–550 g. and fed on a pelleted diet (Bruce and Parkes 1947) supplemented with unlimited cabbage, were injected with B.C.G. vaccine, and sensitivity to tuberculin was estimated by the method of Long and Miles (1950).

All the drugs were suspended in 1 ml. of physiological saline solution and injected subcutaneously six hours before the tuberculin. As in previous work, the diameter of the tuberculin lesions after twenty-four hours was proportional to the logarithm of the dose of tuberculin; and it was possible to estimate the degree of sensitivity by the relative positions of dosage-response lines fitted to the plot of mean lesion diameter against the logarithm of the dose. Changes in sensitivity were measured in terms of the change in potency of standard doses of tuberculin compared with that in control guineapigs.

Results

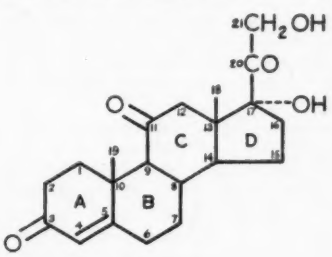
All the effects were highly significant. Active compounds depressed sensitivity in a dose of 5 mg. per kg., whereas inactive compounds were without effect in this dose or in larger doses. In most cases 15 mg. per kg. was injected, but with some steroids the dose was increased—namely, Compound S (25 mg. per kg.); pregnenolone (45 mg. per kg.); deoxycortone (desoxycorticosterone) acetate (45 mg. per kg.); and 3β,20β-diacetoxy-17α-hydroxy-pregn-5-ene (150 mg. per kg.). All the steroids tested either depressed sensitivity or were without effect; in no case was sensitivity increased. The accompanying table gives a list of pregnane and allopregnane derivatives, of which nineteen were examined (see column 6). In addition to these, three other steroids of physiological importance—testosterone propionate, œstradiol-3-benzoate and androstane-diol—were ineffective at 15 mg. per kg.

In a single experiment designed to detect differences between the desensitising potencies of cortisone, cortisone 21-acetate, hydrocortisone, and hydrocortisone 21-acetate, each compound was tested at dose levels of 15 mg. per kg. and 5 mg. per kg. Although special measures were taken to decrease the variation of the test and large groups of animals were used, each compound being injected into 20 guineapigs, no difference in the desensitising activities of the drugs was detected.

The therapeutic efficiency of hydrocortisone acetate varies greatly with the route of administration (Conn et al. 1951, Salassa et al. 1952). Our experiments were therefore repeated with intraperitoneal injections, but again no difference in desensitising potency could be detected. However, it is by no means certain that, if these steroids had been administered by other routes, at a different time interval in relation to the test dose of tuberculin, or by repeated injection, the same results would have been obtained.

Discussion

Many pregnane and allopregnane derivatives have been examined for their effect on rheumatoid arthritis



Cortisone.

—e.g., cortisone (Hench et al. 1949, 1950, Boland and Headley 1949, Thorn et al. 1949, Copeman et al. 1950, Freyberg 1950, Polley and Mason 1950), hydrocortisone, 6-dehydrocortisone, dihydrocortisone, pregnenetriolone

Chemical name	Trivial name	Structural features present in pregnane (or allopregnane) structure			Tuberculin test	Rheumatoid arthritis
		Side-chain	Rings A and B	Ring C		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pregn-4-ene-17α,21-diol-3,11,20-trione	Cortisone, Kendall's Compound E	Dihydroxyacetone	Δ⁴-3-Ketone	11-Ketone	+	+
Pregn-4-ene-11β,17α,21-triol-3,20-dione	Hydrocortisone, Kendall's compound F	,,	,,	11β-Hydroxyl	+	+
Pregn-4-ene-11α,17α,21-triol-3,20-dione	11-Epi-hydrocortisone	,,	,,	11α-Hydroxyl	−	..
Pregn-4-ene-12α,17α,21-triol-3,20-dione	..	,,	,,	12α-Hydroxyl	−	..
Pregn-4-ene-17α,21-diol-3,20-dione	Reichstein's Substance S	,,	,,	Unsubstituted	−*	−
Allopregn-1-ene-17α,21-diol-3,11,20-trione	..	,,	Δ¹-3-Ketone	11-Ketone	−	..
Pregna-4,6-diene-17α,21-diol-3,11,20-trione	6-Dehydrocortisone	,,	Δ⁴,⁶-3-Ketone	,,	..	−*
Allopregnane-17α,21-diol-3,11,20-trione	Dihydrocortisone	,,	3-Ketone	,,	−*	−*
Pregn-5-ene-3β,17α,21-triol-20-one,3-acetate	..	,,	Δ⁵-3β-Acetoxyl	Unsubstituted	−*	..
Pregn-4-ene-17α,21-diol-3,11,20-trione,17α,21-diacetate	Cortisone diacetate	Diacetoxyacetone	Δ⁴-3-Ketone	11-Ketone	−	..
Pregn-4-ene-17α,20β,21-triol-3-one, 21-acetate	Pregnenetriolone acetate	Glycerol,21-acetate	,,	Unsubstituted	..	−
Pregn-4-ene-17α,20β,21-triol-3-one, 20β, 21-diacetate	Pregnenetriolone diacetate	Glycerol,20β,21-diacetate	,,	,,	−	−
Pregn-4-ene-21-ol-3, 11, 20-trione ..	Kendall's Compound A	20,21-Ketol	,,	11-Ketone	−	−
Pregn-4-ene-11β,21-diol-3,20-dione ..	Corticosterone, Kendall's Compound B	,,	,,	11β-Hydroxyl	−	..
Pregn-4-ene-21-ol-3,20-dione ..	Deoxycortone	,,	,,	Unsubstituted	−*	−*
Pregn-5-ene-3β,21-diol-20-one ..	Artisone	,,	Δ⁵-3β-Hydroxyl	,,	..	−*
Pregn-4-ene-17α-ol-3,11,20-trione ..	21-Deoxycortisone	20,17α-Ketol	Δ⁴-3-Ketone	11-Ketone	..	−
Pregn-4-ene-17α-ol-3,20-dione ..	17α-Hydroxyprogesterone	,,	,,	Unsubstituted	−	−
Pregn-4-ene-3,11,20-trione	11-Ketoprogesterone	20-Ketone	,,	11-Ketone	..	−
Pregn-4-ene-3,20-dione	Progesterone	,,	,,	Unsubstituted	−	−
Pregn-5-ene-3β-ol-20-one	Pregnenolone	,,	Δ⁵-3β-Hydroxyl	,,	−	−
Pregna-5,16-diene-3β-ol-20-one ..	..	Δ¹⁶-20-Ketone	,,	,,	−	−
Pregn-5-ene-3β-ol-20-one-16,17-oxide, 3β-acetate	..	20-Ketone-16,17-oxide	Δ⁵-3β-Acetoxyl	,,	−	..
Pregn-5-ene-3β,17α,20β-triol,3β,20β-diacetate	..	17α,20β-Glycol 20β acetate	,,	,,	−	..

* Tested as the 21-acetate.

acetate, Kendall's Compound A, 21-deoxycortisone, 11-ketoprogesterone (Polley and Mason 1950), Reichstein's Substance S, 17α-hydroxyprogesterone (Polley and Mason 1950, Freyberg 1950, Terry and London 1950), pregnenetriolone diacetate (Terry and London 1950), deoxycortone (Polley and Mason 1950, Freyberg 1950), progesterone (Copeman et al. 1950, Freyberg 1950, Kersley et al. 1950, Alexander and Duthie 1950), pregnenolone (Polley and Mason 1950, Copeman et al. 1950, Freyberg 1950, Stone et al. 1950), pregnadienolone (Copeman et al. 1950)—and the results are summarised in column 7 of the table. Columns 3, 4, and 5 (see also the accompanying figure) indicate the structural features present in each compound and help to demonstrate the remarkable degree of specificity of cortisone and hydrocortisone in both therapeutic action and depression of sensitivity, thereby strengthening the analogy between rheumatic man and the tuberculin-sensitive guineapig. This specificity, common to the two biological states, justifies the use of the tuberculin test for screening steroids and other substances for possible cortisone-like action, but at the same time suggests that chemical modification of the cortisone molecule along the lines we have examined is unlikely to yield increased desensitising power and clinical efficacy (cf. Kendall 1951).

The steroids testosterone propionate (Freyberg 1950, Kersley et al. 1950), ethinyl œstradiol (Kersley et al. 1950), androstenedione, and dehydro-*iso*-androsterone (Copeman et al. 1950) have also been found without significant therapeutic effect.

The specificity of cortisone and hydrocortisone in relieving symptoms in rheumatic disease and depressing sensitivity to tuberculin suggests that the sequences of biochemical reactions following injection of these drugs and leading to the two effects may have initial steps in common. If these steps could be identified, a useful advance in the understanding of rheumatic disease and bacterial allergy would have been achieved. The problem of defining them would be difficult if all the evidence were obtained from man, and it becomes even more so when the investigations have been conducted in species of varying sensitivity. The limitations of this type of argument, even when applied to a single well-chosen analogy, have been repeatedly emphasised (Long 1951, 1952), and the ideas which we put forward, based on multiple analogies, must therefore be viewed as highly speculative.

Much work has been and is being done on the pharmacological effects of various steroids (cf. Thorn et al. 1953), and a study of these reveals that certain effects appear to be specific for cortisone and hydrocortisone or else to be produced by these steroids to a far greater degree than by related substances. Such evidence may provide a clue to the metabolic processes we wish to study. In this respect probably the outstanding property of cortisone and hydrocortisone is that they alone among the steroids significantly increase nitrogen excretion. Their profound effect on carbohydrate metabolism may also be of importance. Of other steroids Kendall's Compound A most closely resembles cortisone and hydrocortisone in pharmacological action, yet it influences carbohydrate metabolism to a lesser degree and does not, even in large doses, significantly increase nitrogen excretion. It is without effect on rheumatoid arthritis and tuberculin-sensitivity. These observations suggest that increased nitrogen excretion and a profound effect on carbohydrate metabolism are associated phenomena linked to both therapeutic efficacy and desensitising power.

Cortisone and Protein Metabolism

The action of cortisone in increasing the urinary and serum nitrogen, particularly amino-acid nitrogen, has been demonstrated under a variety of conditions (see for example the extensive review by Thorn et al. 1953). Hoberman (1950), by injection of radioactive glycine, showed that this is probably due both to stimulation of protein katabolism and to inhibition of protein

anabolism. Evidence of action at the amino-acid level is shown by the fact that adrenocortical extract stimulates the activity of liver amino-acid oxidase in normal and in adrenalectomised animals (Cagan et al. 1950).

Adrenocortical stimulation also gives rise to increased urinary excretion of sulphur (Kinsell et al. 1950), which can only partly be explained by increases in urinary cystine and methionine. Since urinary sulphur is derived almost entirely from the sulphur-containing amino-acids (see, for example, Samson Wright 1952), this indicates their increased breakdown. Moreover, sulphur-containing amino-acids are linked either directly, or indirectly, through the intermediary glutathione, with metabolism of carbohydrate (Houssay 1950), and reduced glutathione prevents cortisone desensitisation (Long et al. 1951a and c). Further, both propylthiouracil and insulin, which increase the —SH content of tissues (Houssay 1950), prevent cortisone desensitisation (Long et al. 1951b, Cornforth and Long 1953); and alloxan, which combines with —SH compounds, depresses sensitivity to tuberculin and has relationships with dietary and hormonal factors similar to those of cortisone (Long et al. 1951a and c, Cornforth and Long 1953).

A simple and convenient hypothesis to explain the action of cortisone on tuberculin-sensitivity would be that cortisone interferes with the anabolism of glutathione in the course of a general interference with protein synthesis associated with an increased breakdown of the sulphur-containing and other amino-acids; the resulting fall in glutathione facilitates the oxidation of ascorbic to dehydro-ascorbic acid, this last compound inactivating phosphoglucomutase, thus blocking glycogen breakdown and increasing the tissue concentration of glucose-1-phosphate. Glucose-1-phosphate has been shown to be intimately concerned with desensitisation (Cornforth and Long 1952, 1953).

Summary

Using the response to intradermal tuberculin as a measure of allergic hypersensitivity in albino guineapigs injected with B.C.G. we found that:

Single subcutaneous injections of cortisone, hydrocortisone, and their respective acetates diminished sensitivity.

No difference in desensitising power between these four compounds was detected.

Every alteration to the molecule of cortisone or of hydrocortisone so far examined (apart from acetylation of the 21-hydroxyl group) led to loss of desensitising power.

The specificity of cortisone and hydrocortisone in depressing tuberculin-sensitivity strengthens the analogy between the B.C.G.-infected guineapig and rheumatic man.

Speculations based on the pharmacology of the steroids are made and their possible relation to the mechanism of desensitisation discussed.

We are indebted to Dr. Knud Tolderlund, of the State Serum Institute, Copenhagen, for the B.C.G.; to Prof. R. Meier, of Messrs. Ciba (Basle), to Dr. V. Petrow, of British Drug Houses Ltd., and to Dr. B. A. Hems, of Glaxo Laboratories Ltd., for steroids; and to Miss M. V. Mussett for statistical analyses. It is a pleasure to acknowledge the continued interest and advice of our colleague Dr. R. K. Callow.

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NUTRITIONAL FACTORS IN RENAL DISEASE IN INFANCY

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IT is generally accepted that nutritional disorders are of great importance in the pathogenesis of liver disease in man. This opinion is based upon experiments on rats.

Essential factors for the integrity of the liver are choline and the amino-acids methionine and cystine. In young animals, especially males, lack of choline may also cause renal disease. These lesions were described first by Griffith and Wade (1939) and have been extensively studied by György and Goldblatt (1940), Christensen (1942), Webster (1942), Dessau and Oleson (1947), Hartroft (1948), Kalich et al. (1949), and others. The lesions may be acute or chronic.

The essential features of the acute disease, the "hæmorrhagic kidney syndrome," are as follows: the kidneys are large and swollen; the subcapsular part is hyperæmic; and occasionally hæmorrhages may be found. On microscopy tubular necrosis is found, especially in the outer layers of the cortex. This may be patchy in distribution. The remaining tubules in the cortex show severe swelling. György and Goldblatt (1940) described hyperæmic glomeruli.

The picture of chronic choline deficiency is rather different. It is described as "chronic nephrosis." The tubules are dilated and contain albuminous casts. Some glomeruli are atrophic. Locally an increase of interstitial stroma is found.

It is not surprising that the equivalents of these renal lesions have been sought in man. Kalich et al. (1949) stated: "It seems doubtful whether the present observations have any direct bearing on the pathology of renal disease in man"; Györgi and Goldblatt (1940) said that the experimental findings resembled those of renal cortical necrosis in pregnant women; and Baxter and Ashworth (1946) described chronic nephrosis in patients who had died of cirrhosis of the liver. According to them the renal lesion might not be secondary to the

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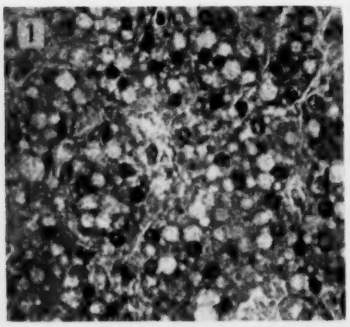

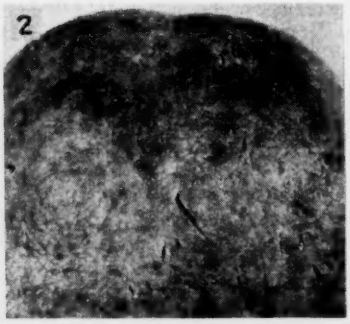

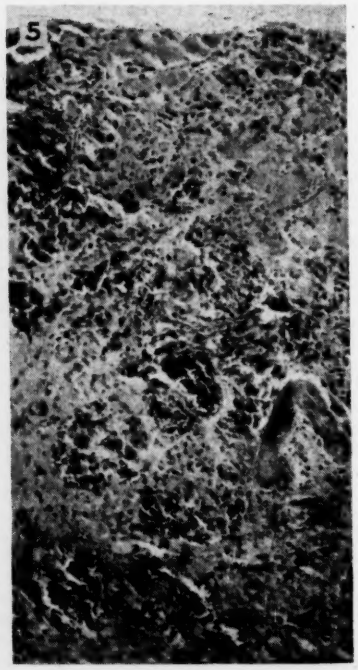

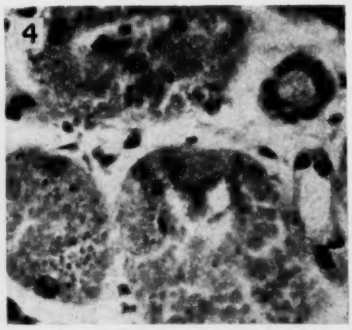

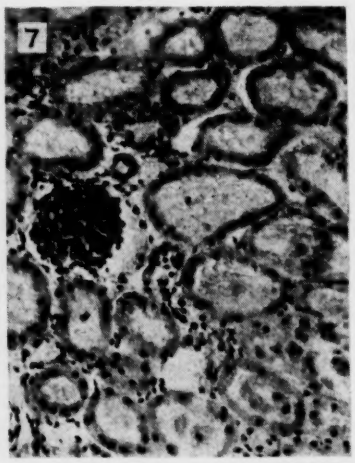

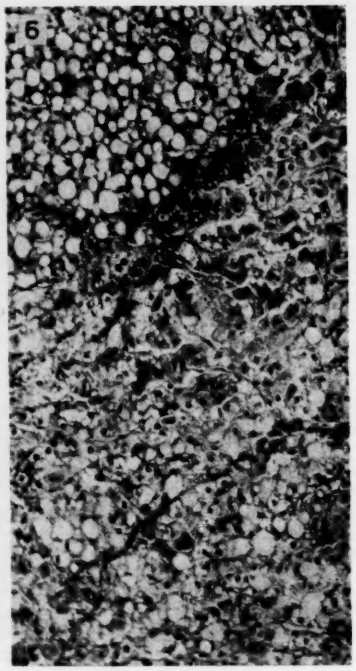

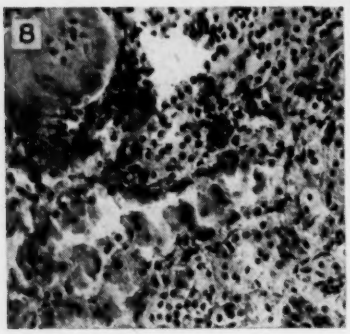

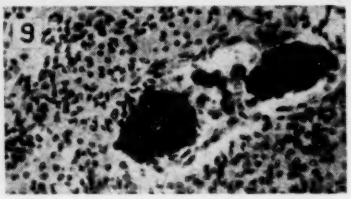

CASE 1.

Fig. 1—Liver with fat droplets.

Fig. 2—Surface of kidney with multiple small hæmorrhages.

Fig. 3—Patchy necrosis of convoluted tubules.

Fig. 4—Granular precipitate in lumen of tubules.

Fig. 5—Areas of congestion, with small hæmorrhages in outer layer of cortex ; patchy necrosis of tubules.

CASE 2.

Fig. 6—Liver with large fat vacuoles and slight increase of connective tissue.

Fig. 7—Dilated tubules containing granular precipitate ; cells are atrophic.

Fig. 8—Hyalinised shrunken glomerulus.

Fig. 9—Calcified debris in collecting tubules.

liver disease, but both the renal and the hepatic lesions might be manifestations of a nutritional disturbance. Nephrotic lesions in adults, however, are often found at necropsy and can hardly be regarded as a specific disorder.

In experiments on animals the hæmorrhagic kidney syndrome develops exclusively in young and rapidly growing animals. A priori it therefore seems obvious to look for the equivalent of the hæmorrhagic kidney syndrome in infants. We describe here two cases with renal and hepatic lesions resembling closely those produced experimentally in animals.

Case-records

Case 1.—A boy, aged 9 months, was admitted to hospital because of severe convulsions. A "rickety rosary" was seen. The epiphyses of the long bones were enlarged. The blood-calcium level was 5·3 mg. per 100 ml. The urine contained albumin and acetone. The convulsions became more severe. The patient died after two days.

Dietary History.—The child was breast-fed till the fifth month. From then on he was given a mixture of rice-flour, sugar, and undiluted cow's milk without any supplements.

Necropsy Findings.—Apart from signs of severe rickets, macroscopic and microscopic abnormalities were found in the liver and kidneys. The liver was enlarged, weighing 295 g., and was pale yellow. Microscopy showed diffuse large fat vacuoles in the liver-cells. Dissociation of the normal architecture was slight. There was neither necrosis nor increase of connective tissue (fig. 1). The kidneys were enlarged and weighed 92 g. On the outer surface and the cut surface were many red spots, in some places nearly confluent on a paler background (fig. 2). Microscopy showed much congestion of the interstitial tissue, especially in the outer layers of the cortex. In some places small hæmorrhages were found. The glomeruli stood out because they were full of blood. An occasional leucocyte was seen, but inflammatory changes were absent. The most striking changes were the lesions of the tubular epithelium. In the cortex the tubule cells were swollen. Sometimes the lumen contained a granular precipitate. Patchy necrosis was found throughout the entire cortex, especially in the outer layer (figs. 3–5). Locally very small areas of degenerated interstitial tissue were seen, with slight leucocytic infiltration. On the whole, however, the absence of inflammatory changes was striking. Sudan-stained sections showed very small fat droplets in nearly all the tubular cells. The collecting ducts in the medulla contained homogeneous casts.

Case 2.—A boy, aged 3 months, was admitted because of vomiting and frequent green stools. Immediately after birth he had been artificially fed. The mother had not the faintest idea how much food the child was given; he drank less and less milk until he became grossly emaciated. He died before a complete examination could be made.

Necropsy Findings.—The liver and the kidneys showed pathological changes, but the other organs were normal. The liver weighed 140 g. Its cut surface was yellow, with small lighter spots. Microscopy showed round foci of large fatty cysts, local thickening of the reticulin framework, and sometimes increase of connective tissue arising from the portal tracts, giving the picture of steatofibrosis (fig. 6). The kidneys were enlarged, weighed 105 g., and were pale brown. The ratio of cortex to medulla was 1 : 2. Microscopy showed striking epithelial changes. In some places the tubule cells were swollen and the lumen was narrow; in others the tubules were dilated and contained granular precipitate. The cells in the walls of these dilated tubules were atrophic (fig. 7). The collecting ducts contained casts. Locally there was calcification, especially at the junction of cortex and medulla (fig. 9). The cells of many tubules in the cortex contained fat (Sudan stain). A few glomeruli were hyalinised (fig. 8). There was locally a slight increase of connective tissue.

Discussion

In case 1 the morphological picture corresponds in all essential points to that described by numerous writers in young choline-deficient animals. Determinations of the serum-calcium levels do not seem to have been made in the experimental disease, and for the present the low serum-calcium level may be attributed to the rickets rather than the choline deficiency.

A superficial resemblance is seen to acute hæmorrhagic glomerulonephritis, which is, however, extremely rare at this age and does not produce the degree of tubular necrosis seen in case 1. Inflammatory changes in the glomeruli, a characteristic feature of acute glomerulonephritis, were lacking; therefore we think it incorrect to label this first case one of hæmorrhagic glomerulonephritis. The picture is more or less similar to that described by Campbell and Henderson (1949) under the name of symmetrical cortical necrosis in infancy and childhood. They described as the essential features hæmostasis in the glomeruli, necrosis of the tubules, and, in severe cases, necrosis of the stroma. They suppose that the renal lesions are only part of a larger picture, which may include diarrhœa and necrotic foci in the liver. These disturbances are caused, according to Campbell and Henderson, by vasospasm in the splanchnic area. We suggest as an alternative that the diarrhœa caused a deficiency which produced both the hepatic and the renal lesions.

Zuelzer et al. (1951) reported eleven cases of renal cortical necrosis in infants and pointed out that symmetrical cortical necrosis might prove to be the commonest cause of renal insufficiency in infancy. A remarkable fact is that this syndrome occurs predominantly in male infants (in Zuelzer's series 9 out of 11).

We believe it possible that nutritional factors are important in the ætiology of these renal lesions because of the analogy with the experimental picture. The rickets in case 1, the boy of 9 months, is proof of malnutrition; and the coexistence of lesions in the liver and kidneys resembling those of the experimental disease is the evidence suggesting choline deficiency

In case 2 malnutrition had been present for some time. This is shown by the severe steatosis of the liver with slight fibrosis. Chronic nephrosis in an infant of this age is rare. No evidence of a poisonous or toxic reason for the lesions was found in case 2. There were no signs of inflammation or of infection elsewhere in the body. We therefore believe that the nutritional history may satisfactorily explain the pathological picture both in the liver and in the kidneys. In favour of this hypothesis is the morphological similarity between the lesions in this patient and chronic choline-deficiency nephrosis in the rat.

Though the present cases have features suggesting choline deficiency, we are fully aware that further study is required before the rôle of choline in the pathogenesis of human renal disease is established.

Summary

Two cases of associated renal and hepatic lesions in infants are described in which injury to the renal tubules was a striking feature.

A nutritional deficiency may have been the underlying cause, because the lesions resemble those found in acute and chronic choline deficiency produced experimentally in rats.

We wish to thank Prof. Charles H. Best, F.R.S., and Prof. W. Stanley Hartroft, of Toronto, for their advice.

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VIRUS PNEUMONIA IN GLASGOW

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INTEREST in virus pneumonia was aroused by its lack of response to antibacterial therapy which was effective against other forms of pneumonia. Several estimates of the frequency of virus pneumonia in Britain have been attempted by the application of diagnostic tests to pneumonia patients admitted to hospital. Such published studies have dealt mainly with the severer forms of pneumonia in patients admitted to hospital in the London area. The present investigation is an attempt to assess the frequency of virus pneumonia diagnosable by laboratory tests in the wider range of cases of respiratory illnesses admitted to two Glasgow fever hospitals after notification as "pneumonia" by general practitioners. The wards whose patients were studied receive a broad sample of febrile respiratory illnesses: during the three years of the study the diagnosis of pneumonia was confirmed in about 60% of cases, and the remainder were miscellaneous infective and non-infective, respiratory, cardiac, and other diseases.

The results of the first fourteen months of this study have already been described (Grist et al. 1952). No detailed clinical analysis is presented in the present paper, which assembles the whole of the routine virus study except tests for influenza infection. Also included are the results of examination of sera received from a few patients from other wards and other hospitals in whom virus pneumonia was suspected on clinical grounds.

Methods

The general and technical methods were described in the previous paper (Grist et al. 1952). Serological tests were applied routinely to unselected consecutive admissions to certain adult pneumonia wards in Knightswood and Ruchill Hospitals during most of a three-year period. 17 children were included in the Q-fever examinations in 1953. The range of serological tests comprised complement fixation with psittacosis-group and *Rickettsia burneti* antigens and tests for the presence of cold agglutinins and agglutinins for *Streptococcus MG*. Tests for Q fever done at the Brownlee Laboratory utilised antigen of the Nine Mile strain obtained from the Q-fever Laboratory, Cambridge: 0·1 ml. vols. of antigen dilution, serum dilution, and complement (2 units) were allowed to react overnight at +4°C before addition of 0·2 ml. of hæmolytic system (1% sensitised sheep cells) and incubation at 37°C. Dilutions were made in saline solution.

During the first two years of the study the attempt was made to examine all the sera by all the selected tests, but thereafter the scale of testing was reduced as indicated below.

Results

Cases with positive serological reactions are summarised in table I, of which the first section includes those with a diagnostic (fourfold or greater) rise or significant fall in titre in any test. The second section shows cases with significantly high titres in any test but without significant changes in titre. The last section includes 2 cases not belonging to the main study but found among the 30 cases of suspected "virus pneumonia" from which sera were received for examination in 1952–53. Titres are cited as reciprocals of initial serum dilutions in complement-fixation tests and of final serum dilutions in agglutination tests.

ORNITHOSIS

Complement-fixation tests with psittacosis-group antigen were applied to 509 patients admitted to Knightswood Hospital from January, 1950, to June, 1952, and to 263 admitted to Ruchill Hospital from November, 1950, to August, 1952. A diagnostic rise in titre was found in 3 cases (0·4%). The clinical findings and absence of history of contact with psittacine birds suggested that the infections were probably due to strains of ornithosis virus. In only 1 case was contact with pigeons traced. The sera of 4 patients gave titres of 40 or more, suggesting previous infection with viruses of the psittacosis/lymphogranuloma-venereum group. In 1 of these cases high titres of 160 suggested very recent infection, possibly related to the pneumonic illness. Of the 27 selected cases of suspected virus pneumonia, 1 reacted positively in the psittacosis test. This case, which will be reported more fully (A. Allison and A. Dick, in preparation), was of particular interest in that serum withdrawn on the thirty-third day of illness gave strong non-specific reactions in serological tests for syphilis. These reactions declined slowly over several weeks. The psittacosis reactions were obtained with heated antigens prepared from the viruses of psittacosis, pigeon-ornithosis, and enzootic abortion of ewes; no fixation took place with antigens prepared from normal yolk-sac, *R. burneti* suspension, or influenza-A and influenza-B soluble antigens prepared from infected chorio-allantoic membranes. Although no serum from the early stage of illness was available, the findings strongly suggest that infection by a virus of the psittacosis group was responsible for the patient's illness. No contact with birds was traced.

Q FEVER

Negative results in tests made by Dr. B. P. Marmion in 76 cases from the beginning of the study were previ-

TABLE I—CASES WITH POSITIVE SEROLOGICAL REACTIONS

—	Age (yr.)	Sex	Test*: titres (days of illness)	Date of onset	Clinical picture
"Unselected" series	60	M	P: 80 (7), 320 (16), 320 (153)	May, 1950	Lobar pneumonia
	59	M	P: 16 (3), 64 (13)	Dec., 1951	Lobar pneumonia
	54	M	P: <10 (7), 80 (17)	Apr., 1952	Lobar pneumonia
	74	M	C.A.: <8 (3), 64 (14), 8 (22)	Nov., 1950	Bronchopneumonia and myocarditis
	28	M	C.A.: 256 (14), 16 (28)	Mar., 1951	Resolving pneumonia
	16	M	M.G.: 80 (5), 160 (10), 10 (70)	Apr., 1952	Lobar pneumonia
	12	M	M.G.: 10 (2), 40 (7)	May, 1952	Acute bronchitis
	21	F	M.G.: 80 (8), 160 (15), 40 (50)	May, 1952	Lobar pneumonia
	5/12	M	Q: 128 (3), 128 (7), 128 (29), 5 (210)	Jan., 1953	Upper respiratory infection and fat-dyspepsia
	59	M	P: 40 (3), 40 (12), 40 (33), 40 (43)	Nov.,1950-Jan., 1951	Lobar pneumonia and recurrence
	60	M	P: 40	Mar., 1951	Fatal pancreatic carcinoma
	28	F	P: 64 (8), 64 (14)	Jan., 1952	Lobar pneumonia
	48	M	P: 160 (5), 160 (11)	May, 1952	Lobar pneumonia
	29	F	M.G.: 40 (12), 80 (19), 80 (41)	May, 1952	Lobar pneumonia
	40	F	M.G.: 40 (6), 40 (12)	June, 1952	Lobar pneumonia
Selected series	40	F	M.G.: 80 (52) C.A.: 1000 (52)	Dec., 1952	Atypical pneumonia
	24	F	P: 400 (36), 320 (43), 200 (54), 40 (72)	Dec., 1952	Pneumonia

*P, psittacosis. Q, Q fever. C.A., cold agglutinin. M.G., *Strep. MG* agglutinin.

TABLE II—BRITISH REPORTED PNEUMONIA SERIES EXAMINED FOR VIRUS INFECTION

Reference	No. of cases positive in tests										
	Psittacosis			Q fever			Cold agglutination		*Strep. MG* agglutination		
	Tested	Positive	With rising titres*	Tested	Positive	With rising titres*	Tested	Positive	Tested	Positive	With rising titres*
Glover et al. (1948)	45	3† (6·7%)	1 (2·2%)	0	—	—	95	2 (2·1%)	0	—	—
Crofton et al. (1951)	110	3 (2·8%)	0	110	2 (1·9%)	2 (1·9%)	110	10 (9·1%)	0	—	—
Jennings (1952)	159	2 (1·3%)	0	159	0	0	159	22 (13·8%)	0	—	—
Virus Reference Laboratory (1953)‡	377	‡	4 (1·1%)	377	‡	22 (5·8%)	0	—	377	‡	41 (10·9%)
Grist	823	7 (0·9%)	3 (0·4%)	127	1 (0·8%)	0	513	2 (0·4%)	771	5 (0·6%)	1 (0·1%)

* Fourfold or greater rise in titre.
† Includes 1 case with negative serological reactions from which a strain of ornithosis virus was isolated.
‡ Only cases with fourfold or greater rise in titre are reported here.

ously reported (Grist et al. 1952). Further tests for Q fever were not made during the rest of the study until *R. burneti* antigen of the Nine Mile strain was obtained from the Q-Fever Laboratory, Cambridge, in 1953. This was used to test sera from 52 Ruchill patients admitted during February and March, 1953, of whom 17 aged 6 years or less were admitted to the children's pneumonia ward. Antibodies were detected in only 1 case, an infant admitted on the second day of an upper respiratory illness with nutritional anæmia and temporary fat-dyspepsia.

Clinical and radiographic evidence of lung disease was absent, apart from "segmental collapse at the left base" detected a month after admission. Apart from a single rise to 100°F two days after admission, the temperature remained normal during the first month in hospital. High titres of antibody were found in serum obtained on three occasions during the first month in hospital (table I). Neither the current illness nor a previous history of gastro-enteritis and probable chickenpox suggested Q fever. No dietary or environmental source of infection was traced. Examination of blood specimens withdrawn in September, seven months after admission, showed a considerable fall in the patient's antibody titre, and no antibody was detected in sera withdrawn at that time from the mother, the father, and 5 of the other 6 children in the family, including the patient's twin. These results were confirmed by independent tests at the Q-fever Laboratory, Cambridge. Negative findings with the sera of the mother and the twin suggest that maternal-transmitted antibody was not the cause of the patient's reactions.

Absence of a rising titre does not associate the findings with the patient's illness in Ruchill Hospital but suggests an undetected infection of untraced origin during the first five months of life.

PNEUMONIAS WITH COLD AGGLUTININS OR WITH AGGLUTININS FOR *Strep. MG*

From January, 1950, to January, 1952, sera from 513 patients were tested for cold agglutinins. Only the 2 (0·4%) previously reported cases showed significant titres. From January, 1950, to July, 1952, sera from 771 patients were tested for agglutinins to *Strep. MG*. Significant titres were found in 5 cases, with changing titres suggesting a relationship to current illness in 3 (0·4%). There was some grouping of cases in the second quarter of 1952. Of 19 cases of suspected virus pneumonia 1 gave a *Strep. MG* agglutination titre of 80, associated with a cold agglutinin titre of 1000; cold agglutination to a titre of more than 8000 had been found a few weeks earlier by Dr. A. Dick, of the Southern General Hospital, Glasgow.

Discussion

The frequency of virus pneumonia diagnosed by laboratory tests in several British series of pneumonia cases is summarised in table II.

The first three series were all based on the London area and were, to some extent, selective through the admission of the severer forms of pneumonia for hospital treatment. The Virus Reference Laboratory (V.R.L.) series is even more highly selected and includes cases in the series of Crofton et al. (1951) and Jennings (1952). Virus or primary atypical pneumonia was the suspected clinical diagnosis in 64% of the V.R.L. pneumonia cases shown in table II, from which have been omitted cases of suspected influenza, febrile catarrh, acute bronchitis, and pyrexia of unknown origin. The relatively low proportion of serologically positive cases in the Glasgow series may largely be due to the wider range of conditions, including mild illnesses, included in the study group.

The series of Glover et al. (1948) consisted mainly of pneumonias of uncertain ætiology. Both attempted isolation of virus and complement-fixation tests against mouse-lung antigen were utilised to detect psittacosis. Only the 3 cases in which "good evidence" of infection was reported are included in table II. In the other series listed the complement-fixation test with yolk-sac antigen was used, and smaller proportions of psittacosis-group infections were diagnosed. Only single sera were tested from the 2 cases with positive reactions for psittacosis reported by G. H. Jennings (personal communication): one showed a titre of 160 on the tenth day of illness, and the other a titre of 40 on the third day of illness, two days before death.

The rather high proportion (5·8%) of Q fever in the V.R.L. series is related to special investigations of this infection in Kent and Devon. Only 127 Glasgow cases were tested for Q fever and, though no case of this illness was detected, the finding of antibodies in the serum of 1 infant provides the first evidence of this infection in Scotland.

No Glasgow case was positive in more than one test, and by summation of the percentages in table II it appears that significant titres in any test were shown by only 2·7% of all the Glasgow cases, with significantly rising titres in 0·9%, equivalent to less than 2% of cases with a confirmed final diagnosis of pneumonia.

In the V.R.L. series a high proportion of cases were found positive by serological tests in the group diagnosed clinically as virus or atypical pneumonia (Virus Reference Laboratory 1953). The difficulty of clinical diagnosis, however, is emphasised by the serologically positive cases in the other groups and by the clinical pictures of the Glasgow cases listed in table I. However, it seems that only a small minority of pneumonias observed in this country are attributable to virus infections recognisable by available routine laboratory tests. The possible rôle of virus infections for which no diagnostic tests are available has not yet been determined. Fortunately the

vast majority of pneumonia cases in this country are amenable to antibacterial therapy with sulphonamides or with penicillin (Anderson 1948, Medical Research Council 1951).

Summary

The virus ætiology of pneumonia admissions to two Glasgow fever hospitals was studied by serological methods over a three-year period. Evidence of ornithosis was found in 0·4% of 823 cases. Cold agglutinins were present in 0·4% of 513 cases. Rising titres of *Strep. MG* agglutinins were found in 0·1% of 771 cases. No case of Q fever was detected among 127 patients, but antibodies in the serum of 1 infant suggested recent infection with *R. burneti*. Serological evidence of virus pneumonia was found in less than 2% of confirmed pneumonia cases.

For advice and help in several aspects of this study I wish to thank Dr. F. O. MacCallum, Dr. A. D. Macrae, and Dr. B. E. Andrews, of the Virus Reference Laboratory, Colindale; Dr. B. P. Marmion and Dr. M. G. P. Stoker, of the Q-Fever Laboratory, Cambridge; Dr. S. I. A. Laidlaw and the staff of the Public Health Department, Glasgow; and numerous clinical colleagues at Knightswood and Ruchill Hospitals. Two cases are described by permission of Dr. A. Dick and Dr. A. Allison, jun., of Glasgow Southern General Hospital. During the first two years of the study a grant was received from the Medical Research Council. For his devoted technical assistance I am indebted to the late Mr. G. Rowan, A.I.M.L.T.

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CHEMOTHERAPY IN SKELETAL TUBERCULOSIS *

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THE introduction of antibiotics has inevitably altered our approach to skeletal tuberculosis. Adequate chemotherapy has allowed us to return successfully to the radical methods of local attack, which were tried and found wanting fifty years ago because they were then so often followed by sinus formation and dissemination of the disease.

But, even though we are becoming more adventurous in our local attack on tuberculosis, we are not losing sight of the importance of general treatment. Skeletal tuberculosis is a metastatic lesion spread from (usually) a lymphatic gland—"a lesion inaccessible, insidious, and in issue far more dangerous than the skeletal lesion itself" (Girdlestone 1940). It is this glandular focus that makes the sanatorium régime imperative.

Children respond well to this régime, and the glandular focus usually heals; but this takes a considerable time, and prolonged splintage leads to stunting, physical and mental. Adults respond less well and, if they return to poor home conditions, the glandular focus not infrequently becomes active again, leading to a substantial late mortality from associated lesions. Cases that do not respond to general treatment are liable to the complications of tuberculous meningitis, miliary spread, and sinus formation, with secondary infection and amyloid disease.

* Read at the Annual Meeting of the British Tuberculosis Association, Edinburgh, 1953.

Chemotherapy and local surgery have certainly reduced both the period of strict immobilisation required and the incidence of complications of general treatment (Wilkinson 1953, Compere et al. 1952, Bosworth et al. 1952, Evans 1952). It must be emphasised, however, that antibiotics are not a panacea, and that they should be reserved for critical phases in the course of the disease. Such critical phases are progressive lesions, multiple lesions, sinuses, operations, and synovial infections.

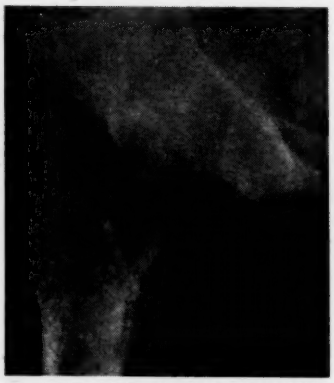


Fig. 1—Tuberculous trochanter treated by chemotherapy and movements which resulted in spread of infection to the hip.

Surgical Pathology

Before the local treatment of skeletal lesions is discussed, some aspects of the surgical pathology must be considered. Joints are commonly involved at the synovial reflexion; the blood-supply of this region, the circus vasculosus, comprises end-arteries which are subject to endarteritis and periarteritis. The heart of the tuberculous lesion is thus cut off from its blood-supply, and avascular necrosis of bone is fairly common. Once this has happened, streptomycin in adequate concentration cannot reach the osseous lesion any more than penicillin can penetrate sclerotic bone in chronic osteomyelitis. (Small amounts of streptomycin may, however, penetrate the centre of the lesion by diffusion through the extracellular fluids; and this may be actively harmful, producing an inadequate antibiotic level, with the emergence of resistant strains of the bacillus.) Iproniazid ('Marsilid') is said to stimulate the growth of new capillaries, and may by virtue of this action penetrate the heart of the lesion (Bosworth et al. 1952). Surgical interference not only opens the way for antibiotics but also, by releasing tuberculous material into the tissues, may have an antigenic effect (Wilkinson 1953).

a *b*

Fig. 2—Tuberculous trochanter: *a*, associated with large abscess in thigh; *b*, after excision of trochanter and abscess.

Diagnostic Procedures

The introduction of chemotherapy has affected our diagnostic procedures to a considerable extent; indeed our whole outlook on this aspect of management has altered. In the past a provisional diagnosis was accepted as an indication for sanatorium treatment, and the subsequent course either proved or disproved the tuberculous nature of the disease. Now that there is a good prospect of obtaining a mobile joint if the disease is diagnosed while still in the synovial stage, early proof of the lesion is imperative. Among the methods of obtaining proof, direct inspection of the joint with synovial biopsy is being used more and more, and antibiotic cover means that the biopsy wound will heal. The old method of wait and see has given place to a policy of look and see.

Local Treatment

In my opinion the principles of local treatment remain unchanged and are as follows:

(1) *A tuberculous lesion requires local rest to prevent deformity and to favour local healing.* Fig. 1 shows a tuberculous trochanter femoris treated elsewhere with streptomycin, *p*-aminosalicylic acid (P.A.S.), and movements of the hip "to prevent the joint from becoming involved and fixed"—which it consequently did.

Fig. 3—Tuberculous dorsal spine with paravertebral abscess.

(2) *Extra-articular foci should be excised where possible before the adjacent joint becomes involved.* Fig. 2*a* shows a tuberculous trochanter femoris associated with large abscess in the thigh. This was treated by excision of the abscess and the trochanter under cover of streptomycin and P.A.S., the wound healing by first intention. This operation is now safe and satisfactory, even if the lesion is inadvertently opened. Fig. 2*b* shows the postoperative appearance.

(3) *Tuberculous pus should be removed as soon as it is formed.* In most instances this is possible by aspiration of the abscess, but in some cases the pus is inaccessible to the needle—e.g., in the paravertebral abscess so commonly found with tuberculosis of the dorsal spine. Formerly such abscesses were drained only if they were large enough to cause paraplegia, but it has been shown that the spinal lesion seldom heals soundly in the presence of such an abscess, whether or not posterior spinal fusion has been done (Swett et al. 1940). It is now our policy to drain virtually all such abscesses by costotransversectomy. Just as in acute osteomyelitis it is the tension in the bone rather than the infection that causes thrombosis of vessels and the formation of a sequestrum, so (we believe) tuberculous pus under tension causes delay in healing if not spread of tuberculosis. Fig. 3 shows tuberculosis of the dorsal spine with a paravertebral abscess. This was treated with a plaster bed, by costotransversectomy, and with streptomycin and isoniazid; and bone fusion took place within a year.

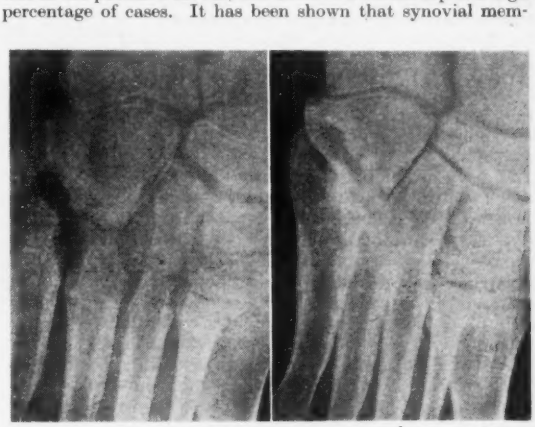
(4) *Every effort should be made to heal sinuses and to prevent secondary infection.* This can usually be achieved by using local and general antibiotics. Fig. 4 is a sinogram showing extensive tracks running through the pelvis. The sinuses had been present for eight years, and healed in five months when

Fig. 4—Sinogram showing extensive tracks through pelvis.

treated with streptomycin and isoniazid and local streptomycin. Surgery may also be needed to obtain healing of the sinuses, particularly if the walls of the track are very thick, or if there is an associated sequestrum of bone.

(5) *The ultimate aim in the treatment of tuberculous joints is to obtain either a freely mobile joint or sound (bony) ankylosis.*

(*a*) If the joint infection is synovial—i.e., if the joint surfaces are undamaged when the patient is first seen—there is every prospect of obtaining a mobile joint by the use of conservative measures coupled with chemotherapy. The tuberculous exudate does not contain proteolytic enzymes as does the exudate in septic infections; so the cartilage tends to persist (Luck 1950). These are the cases in which early diagnosis is essential to save the function of the joint and for which synovial biopsy is being widely used. There are, however, certain synovial infections, particularly of the hip, which do not respond to this régime, possibly because endarteritis prevents an adequate concentration of antibiotics from reaching the infected synovium. In these cases excision of the synovial membrane in the acute stage may turn the tide in the patient's favour, and leads to a mobile hip in a high percentage of cases. It has been shown that synovial mem-



a *b*

Fig. 5—Tuberculous tarsus: *a*, before operation; *b*, after curettage and chip-grafting.

brane regenerates rapidly after its removal (Key 1925), and the operation is followed by the rapid formation of fresh normal synovial membrane carrying blood-vessels through which the antibiotics can circulate.

(*b*) If the joint surfaces are damaged when the patient is first seen, one should aim at obtaining a bony ankylosis in good position. Children have a natural tendency towards healing, and one is reluctant to interfere with rapidly growing bone, for fear of producing a progressive deformity; operation in children to obtain bony fusion is therefore usually deferred until the age of 13 or 14. Adults heal less well, and do not tolerate the sanatorium régime for prolonged periods; the aim in them should be to achieve fusion as soon as it is apparent that the patient's general resistance has begun to overcome the effects of the bacillary invasion. Chemotherapy will reduce the time required for this, particularly in cases resistant to ordinary constitutional treatment.

Chemotherapy

Chemotherapy has had a considerable effect on the technical methods used to obtain such bony fusion. Before its introduction one aimed at producing arthrodesis by extra-articular methods, avoiding the site of the disease and therefore the risk of dissemination. Now one has no hesitation in opening the diseased joint, scraping out sequestra and tuberculous granulation tissue, and packing the resultant cavity with bone chips to obtain solid bony fusion across the very site of the disease, even in the spine. Fig. 5*a* shows a tuberculous tarsus. This was treated by curettage of the lesion, followed by chip-grafting of the resulting cavity under cover of streptomycin and P.A.S. Fig. 5*b* shows the postoperative appearance.

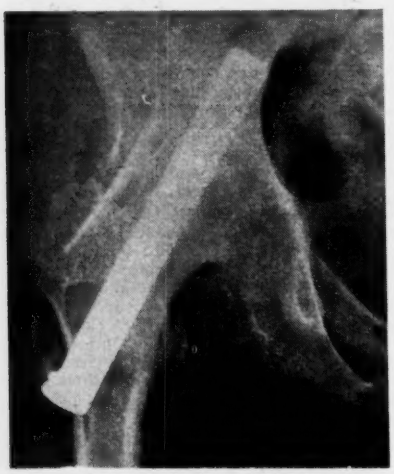


Fig. 6—Iliofemoral arthrodesis, with Smith-Petersen pin across joint to obviate postoperative plaster.

Not only is one prepared to enter a tuberculous area under antibiotic cover but also one is prepared to introduce foreign material, as in using internal fixation with a Smith-Petersen pin instead of external fixation with plaster after a grafting operation. Fig. 6 illustrates an iliofemoral arthrodesis of a tuberculous hip with pin fixation.

Elderly people seldom achieve final healing of tuberculosis; indeed skeletal tuberculosis in people aged more than 60 behaves more like a neoplasm than an infection. For these patients amputation was often advised, and where this was impossible local excision was done to remove a massive nidus of infection. Chemotherapy has reduced the hazards of such operations. The upper part of fig. 7 shows acute tuberculosis of the right hip developing fifty years after disease of the left hip which left the patient with a fibrous ankylosis in a position of gross deformity. A pseudarthrosis was done on the right side and an osteotomy on the left; these operations produced a mobile right hip and did away with an apparent shortening of five inches. The lower part of fig. 7 shows the postoperative appearance.

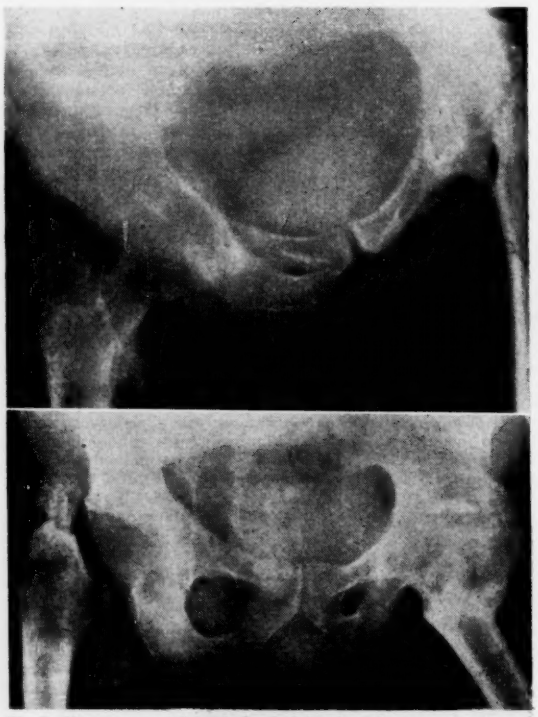


Fig. 7—*Upper*, acute tuberculosis of right hip and greater trochanter developing 50 years after disease of left hip which is fixed in flexion and adduction; *lower*, after pseudarthrosis of right hip and osteotomy of left hip.

Antibiotics

Lastly, antibiotics can be expected to shorten the course of the disease. Rigid immobilisation for a long time is probably no longer essential. With its disappearance one hopes that the untoward effects of immobilisation—renal calculi, osteoporosis, frame chest, and premature epiphyseal fusion which leads to that orthopædic abomination, the high boot—will also become things of the past.

Summary

General treatment is still essential to heal the (glandular) source of skeletal tuberculous infections.

Early proof of diagnosis by biopsy is very desirable.

Chemotherapy should not be used indiscriminately. Indications are: progressive lesions, multiple lesions, sinuses, operative cover, and synovial infections.

The principles of local treatment remain unchanged, but chemotherapy is altering the surgical techniques of local attack.

Chemotherapy and local surgery have reduced the period of strict immobilisation required and the complications of general treatment of skeletal tuberculosis.

I should like to thank Mr. E. S. Evans, Mr. H. H. Langston, and Mr. V. H. Ellis for their encouragement, and for permission to publish cases under their care.

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CARDIAC ARREST

RECOVERY AFTER PROLONGED COMA

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THE following case-report may afford some encouragement to workers suddenly called on to deal with the serious effects of cardiac arrest and cerebral hypoxia during anæsthesia.

Case-report

A housewife, aged 41, came to the outpatient clinic with ten days' history of central abdominal pain. There was deep-seated localised tenderness at McBurney's point. Systematic examination revealed no other lesion, and subacute appendicitis was diagnosed.

Operation was performed on Aug. 14, 1953, after premedication with 'Omnopon' gr. $^1/_3$ and scopolamine gr. $^1/_{150}$. On arrival at the operating-theatre the patient was normally drowsy. Anæsthesia was induced with sodium thiopentone 0·5 g. diluted in 10 ml. of sterile distilled water given slowly intravenously at 2.45 P.M. This dose produced the customary apnœa. While the abdomen was being towelled off, the anæsthetist connected the patient to a closed anæsthetic circuit supplying nitrous oxide, oxygen, cyclopropane, and ether. These steps took about $2^1/_2$ min. It was then noted that the patient's colour was blotchy. Her pulse was impalpable, and she was having artificial respiration from the rebreathing-bag. The abdomen was opened through a Battle's incision. The tissues did not bleed. There was no aortic pulsation and no heart-beat. The left ventricle was at once rhythmically compressed by the surgeon's right hand placed below the diaphragm. After about 15 sec. the heart gave some irregular contractions and after about $^1/_2$ min. it took up a normal rhythm. A chronically thickened appendix was rapidly removed, and the wound, now bleeding freely, was closed in layers. Spontaneous respiration began about $1^1/_2$ min. after the heart-beat. The duration of cardiac arrest was $2^1/_2$–3 min.

Postoperative Progress.—The patient remained unconscious for 7 days. During the evening following operation, when the effects of the anæsthetics would normally have worn off, she was still in deep coma, her respiration had become irregular, her pulse-rate had fallen to 50, her blood-pressure was 110/60 mm. Hg, and her temperature was 97°F. Intramuscular injection of nikethamide 4 ml. was given at intervals. Oxygen was supplied by nasal catheter. A course of dehydration therapy was begun: 50 ml. of 50% glucose intravenously, followed by 2 pints of triple-strength plasma to which 'Methedrine' 30 mg. per pint had been added, was given in 8 hours. The foot of the bed was raised 7 in. on blocks, and the patient was turned on to the opposite side every hour. Intramuscular penicillin 250,000 units 6-hourly was given prophylactically. During the night 6 oz. of urine was withdrawn by catheter.

1st Postoperative Day.—The patient was still in coma but not so deeply as previously. Some spontaneous movements were noted. Later she showed restlessness amounting to violence lasting several minutes. Her pulse-rate rose to 100 and temperature to 99°F. Respirations were stertorous. The face was congested; the skin of the trunk and limbs was warm and perspiring freely. The tendon-jerks were exaggerated, neck rigidity was present, and plantar responses were flexor. The corneal reflex was present. The pupils were dilated and reacted sluggishly to light. Ocular movements were coördinated but aimless. There was response to pressure on the supra-orbital nerve. The swallowing reflex was present. Lumbar puncture produced clear cerebrospinal fluid (C.S.F.) under a pressure of 200 mm.; the Queckenstedt test was positive. Treatment consisted of a further 100 ml. of 50% glucose intravenously and a rectal drip of 50% magnesium sulphate. Nasal oxygen and head-down tilt were maintained. Urinary output fell considerably, only $2^1/_2$ oz. being withdrawn by catheter in 12 hours. The patient's tongue and lips became dry, and sweating ceased. By mid-afternoon it was judged that further active dehydration would be unwise, and fluid replacement was begun. A Ryle's tube was passed. 4 oz. of equal parts of milk and water was given by tube 2-hourly. The feeds were later supplemented by 25 g. of glucose. The urinary output rose, and during the night 24 oz. of urine was withdrawn. During the night the patient became noisy and very restless and required chloral hydrate gr. 30 by tube followed by intramuscular paraldehyde 2 ml. at intervals.

2nd Day.—Epileptiform convulsions were observed during the night, with violent restlessness and incontinence of urine and fæces. During the late afternoon coma lightened and the patient appeared to be listening. She did not respond to simple commands. Her pulse-rate was 100–110, and respirations regular and stertorous. Her intake consisted of 2-hourly tube-feeds of milk and water with glucose. The urinary output could not be measured.

3rd Day.—Sedation was required for nocturnal restlessness. The patient seemed to hear what was said to her but made no reply. She obeyed the order to put out her tongue. Her pulse-rate fell to 80 in the evening. Intake as previously. Incontinent of urine.

4th Day.—She became semiconscious during the early morning and swallowed some fluids. Coma deepened during the afternoon; she became noisy, and chloral gr. 30 was given by tube. Intake slightly less. Dark urine voided infrequently.

5th Day.—Sedatives required three times for restlessness during the day. Fluids taken by mouth. Urine concentrated. Pulse-rate rose to 100.

6th Day.—Restless during the night. Sedative given. Slept until 11 A.M. Restless on waking but able to take cups of tea, coffee, and cocoa during the afternoon. It was reported that she recognised the visiting priest.

7th Day.—Slept several hours and remained quiet on waking. Power of speech returned. No sedatives required. A neurological examination was made by Dr. R. A. Henson, who reported as follows: "Carries out simple commands. Knows right and left. Knows she is unwell and shows some anxiety. Bilateral foot and toe grasp reflexes." Pulse-rate fell to 80. Respirations normal. Took a soft diet well and was encouraged to drink plenty. Used a bedpan.

Thereafter improvement was uninterrupted. She was allowed up on the 10th day, when the sutures were removed. Speech became less slurred each day. She had amnesia for all events between the time of going to the theatre and the morning of the 7th postoperative day. She was discharged home on the 21st day, apparently normal. 2 months later she was perfectly well.

Discussion

Subsequent inquiries into the patient's previous medical history revealed that she was intolerant to "aspirin," of which gr. 5 produced in her a state of coma lasting several hours. It is clear that she was hypersensitive to certain, if not all, depressants. A moderate dose of thiopentone (0·5 g.), perhaps fortified by the premedication, produced apnœa and cardiac arrest almost instantaneously. The duration of cardiac arrest was estimated as 3 min., the heart being restarted after cardiac massage for 30 sec. Spontaneous respiration began $1^1/_2$ min. later. The resulting acute cerebral hypoxia was followed by cerebral œdema with raised intracranial pressure. This yielded slowly to dehydration therapy assisted by other measures. Coma persisted for 7 days. In spite of this there was no residual neurological defect.

A paper by Sadove et al. (1953) on the acute hypoxic episode was of great help in planning the postoperative treatment of this case. These workers point out that after cardiac arrest cerebral œdema is inevitable. If this is to be averted, they suggest, the heart must be restarted within 4 minutes. In Cole's (1951) case, however, asystole persisted for 11 min. and recovery was complete. Seldon et al. (1949) emphasise the life-saving value of concentrated human serum-albumin in post-anæsthetic encephalopathy. They described two cases. In the first case 100 ml. of 25% serum-albumin was given to a patient in coma 24 hours after the operation. The infusion was repeated on the second and third post-operative days, and the patient recovered on the 4th day. In the second case, 3 doses of 25% serum-albumin (total 300 ml.) were given within the first 12 postoperative hours, and the patient recovered on the day following.

Pulmonary œdema was another feature of their cases, and they treated it by inflating the lungs with oxygen at a pressure of 4 mm. Hg. Seldon et al. conclude that a large part of the permanent cerebral damage following a sublethal period of anoxia is due to untreated cerebral œdema.

Summary

An acute hypoxic episode is described in a patient who received intravenous thiopentone. Cardiac arrest was overcome 3 minutes after its onset. The resulting coma, lasting 7 days, was overcome by vigorous dehydration and other measures.

Hypersensitivity to depressants should be excluded before giving anæsthetics.

My thanks are due to Mr. S. G. Nardell, F.R.C.S., for permission to publish, and for help in preparing this article; and to Dr. A. D. Cole, house-surgeon, and to Sister M. G. Connolly and others for their enthusiastic help in the management of the patient.

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ESTIMATION OF ISONIAZID

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PREVIOUSLY described methods of estimating isoniazid (Rubin et al. 1952, Kelly and Poet 1952) have the disadvantage that they are somewhat cumbersome and do not lend themselves to the routine analysis of many samples. A quick and convenient method of determining the blood-isoniazid level would be of value in following the course of treatment. The method described below should prove useful in this respect. It depends on the reaction of the $-NH_2$ group of the hydrazide fraction of the molecule with 1 : 2-naphthoquinone-4-sulphonic acid. Streptomycin does not interfere with this reaction, but *p*-aminosalicylic acid also reacts with the naphthoquinone-sulphonate reagent; hence the estimation cannot be used in the presence of the latter.

The method can be used for estimating isoniazid in blood, urine, and certain tissues—e.g., lung. From determinations in rabbits of isoniazid levels in plasma and whole blood after oral dosage, it appears that isoniazid does not penetrate the circulating red cells; so plasma or serum, rather than whole blood, may be used for the estimation, and this has the advantage of giving higher levels of isoniazid and a better yield of filtrate. The lack of penetration of the red cells by isoniazid is of interest in view of the experiments of Mackaness and Smith (1952), who showed, from their work on the intracellular activity against tubercle bacilli, that the drug will freely penetrate macrophages.

Method

PREPARATION OF "PROTEIN-FREE" FILTRATE OF PLASMA OR SERUM

Plasma or serum 4 ml. is mixed with distilled water 5 ml., zinc-sulphate solution (9% *w v*) 4 ml., and 0·1 *N* sodium hydroxide 5 ml. added, with mixing after each addition. The tube containing the mixture is next lightly plugged with cotton-wool and heated in a steam-bath for three minutes. After cooling, the mixture is filtered through a Whatman no. 42 filter-paper. A blank filtrate is prepared from 4 ml. of normal plasma or serum in an exactly similar manner at the same time. The dilution of the sample is 1/5 and is suitable for isoniazid levels usually found during therapy. For levels higher than 1 mg. per 100 ml. a 1/10 dilution of the sample in which distilled water is substituted for half the volume of plasma or serum should be used.

PRODUCTION OF COLOUR

To 9 ml. of the filtrate is added 1 ml. of an aqueous solution of sodium 1 : 2-naphthoquinone-4-sulphonate solution (0·1% *w/v*), and the mixture is kept in the dark for an hour for the colour to develop. The colour is next measured absorptiometrically with 4-cm. cells, the readings being made against a similarly treated blank filtrate with an Ilford filter no. 601 or 621. The maximal absorption of the isoniazid colour is at 455 mμ.

The isoniazid level is determined from a standard curve prepared in an exactly similar manner with normal plasma or serum containing added isoniazid covering the range 0–1 mg. per 100 ml.

The naphthoquinone-sulphonate solution should be prepared freshly each day and stored in a dark bottle.

The blank filtrates of plasma or serum give, with the naphthoquinone-sulphonate reagent, a yellow colour which, with dilutions of 1/10 or more, is identical with that obtained with an aqueous filtrate. Filtrates from a 1/5 dilution give somewhat darker colours, but the blank readings from five such samples did not differ significantly from each other; hence any errors due to this source are eliminated by making the readings against a blank filtrate prepared from any sample of normal plasma or serum. With a 1/10 dilution the readings may be made against an aqueous blank.

The results, expressed as percentage recoveries, of estimations of different levels of isoniazid added to serum are shown in the accompanying table. The levels selected were in the range found during therapy with isoniazid, and the results are satisfactory for clinical purposes, the over-all mean recovery of the four series of determinations being 100·5%. The method is rather more accurate for the higher levels of isoniazid, the standard error for the six estimates of the 0·3 mg. per 100 ml. and 0·6 mg. per 100 ml. levels being ± 2·6%, compared with ± 3·7% and ± 3·2% for the 0·125 mg. per 100 ml. and 0·15 mg. per 100 ml. levels respectively.

ESTIMATION IN TISSUES

For the estimation of isoniazid in certain tissues—e.g., the lung—a known weight of the tissues is ground up with a little washed silver sand and washed into a stoppered cylinder with a small amount of distilled water. After being allowed to macerate for about half an hour to ensure adequate extraction of the isoniazid, zinc-sulphate solution 2 ml. per g. of tissue and sodium hydroxide 2·5 ml. per g. of tissue are added, the volume is adjusted to 9 ml. per g. of tissue with distilled water. The mixture is well shaken and next transferred to a boiling-tube, which is lightly plugged with cotton-wool

ESTIMATION OF ISONIAZID IN SERUM

Concentration of isoniazid (mg. per 100 ml.) added			
0·125	0·15	0·3	0·6
Concentration found (% recovery)			
95·2	90·0	106·6	105·3
99·2	96·6	97·7	92·5
90·0	95·0	111·6	93·3
112·8	110·0	103·3	104·2
95·2	108·3	94·3	104·1
110·0	100·0	105·5	93·0
Mean ± standard error			
100·4 ± 3·7	100·0 ± 3·2	103·2 ± 2·6	98·7 ± 2·6

and heated for three minutes in a steam-bath. After cooling, the mixture is filtered through a Whatman no. 42 filter-paper, and the filtrate is coloured in the usual way. The dilution of the tissue is 1/10, and readings should be made against a blank filtrate from a 1/5 dilution of normal plasma or serum.

APPLICATION TO URINE

Preliminary dilution of urine with distilled water is necessary, and a zinc-hydroxide filtrate of the diluted urine is then prepared as with the plasma filtrate. Most satisfactory results are obtained with dilutions of 1/50 or more, since normal urine then gives a reading identical with that obtained with water, and the sample may be read against an aqueous blank.

Summary

A quick and convenient method for estimating isoniazid in plasma or serum is described.

Estimates satisfactory for clinical purposes can be made within the concentration range found during isoniazid therapy.

The method can be used for estimating isoniazid in urine and certain tissues—e.g., the lung.

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Reviews of Books

Treatment of Mental Disorder

LEO ALEXANDER, M.D., director, neurobiological unit, Division of Psychiatric Research, Boston State Hospital. Phil delphi and London: W. B. Saunders. 1953. Pp. 507. 50*s*.

Dr. Alexander truly says that there has been a deplorable tendency for psychotherapy and physical treatment in psychiatry to be developed and written about in isolation from each other: it could often be said, in glaring antagonism. In this ambitious and painstaking book he has tried hard to bring them together. But, like many a go-between, he has been unable to hide his partiality; it is physical methods that have his affection, and among physical methods electrical stimulation is his favourite: its discussion occupies about a third of the book. On the technical details and appraisal of the various electroconvulsive procedures he writes *con amore*, and nowhere else can so full and well-documented an account be found as here. Good documentation is one of the virtues of the book throughout, though the frequent references and abstracts make it perhaps less handy for beginners in psychiatry, who may not want to verify statements and check evidence. Although Dr. Alexander makes a strong and well-justified plea for fuller therapeutic data, uniformly presented and statistically analysed, he is himself at times culpable in his statistical procedures, especially in the summed tables and inferences set out in chapter XII, which deals with the results of treatment. Nevertheless his book is in advance of its predecessors in systematic fullness and recognition of the varied physiological and psychological problems raised.

Edinburgh Post-Graduate Lectures in Medicine

Vol. 6. 1950–53. Edinburgh: Oliver & Boyd (for Honyman Gillespie Trust). 1953. Pp. 508. 21*s*.

THE 34 lectures delivered in the Edinburgh Royal Infirmary under the auspices of the Honyman Gillespie Trust during the years 1950–53 are presented in this volume, the sixth of the series. Their subjects are diverse, linked only by the personal interest and mature experience which each contributor has brought to his chosen topic, and the standard of presentation inevitably varies.

Surveys of important clinical problems in medicine, surgery, and gynæcology are interspersed with philosophical analyses of such matters as the administrative problems of a medical school (Reflections from a Provincial Deanery by Dr. J. G. McCrie). Dr. Ninian Bruce contributes a profound account of heredity and germ-cell continuity, and Dr. Fraser Roberts a useful review of sex-linked genes in man. It is fitting that one of Dr. Margaret Tod's last contributions, made towards the end of a brilliant career, should be printed in this volume from her own school; her account of the reticuloses and lymphoreticular sarcomas and of their treatment is lucid and practical. Under the terms of the bequest by which these lectures are supported, references to experiments on animals are debarred, but the availability of micro-organisms for bio-assay enables Dr. R. H. Girdwood to present the laboratory as well as clinical aspects of his work on vitamin B_{12} and other hæmopoietic factors. Many of the illustrations are first-class—notably the angiograms, drawings, and colour photographs which accompany Mr. John Gillingham's lecture on arteriovenous malformations of the head.

A quest for information on a specific problem is perhaps unlikely to include a search between the covers of this book; its appeal is rather to the reader with time and inclination to exercise his mind in leisurely contemplation of a selection of interesting and varied topics.

Recurrent Dislocation of the Shoulder

JAMES A. DICKSON, M.D., chief, department of orthopædic surgery, Cleveland Clinic Hospital; ALFRED W. HUMPHRIES, M.D., department of orthopædic surgery, Cleveland Clinic Hospital; HARRY W. O'DELL, M.D., chief, department of orthopædic surgery, Akron Clinic. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1953. Pp. 158. 35*s*.

IN their foreword the authors say: "This compendium has been arranged to facilitate a clearer understanding of the factors involved in recurrent dislocation of the shoulder." They offer "no brief for any particular theory of the pathology nor for any particular form of treatment." The reader about to embark on work in this field will find here conveniently collected together a summary of all the important work and opinions hitherto, but little to help guide his judgment of what is sound and what should be discarded; he will often wish that the writers had been more critical.

There are chapters on phylogeny, ontogeny, and physical dynamics of the shoulder which scarcely advance the reader's knowledge of the subject under discussion; and under the heading of treatment there is, surprisingly, no mention of the importance of correct positioning of the patient for the various operations, nor of the results that have been obtained. The illustrations are largely reproductions from previous publications, and the photographs of what were originally colour prints are not always satisfactory.

Apart from these criticisms, however, this book succeeds very well in its stated objects and will save much delving by future workers.

Epileptic Cramp Attack as a Psychosomatic Reaction

RAF. GORDIN. Copenhagen: Ejnar Munksgaard. 1953. Pp. 165. Dan. Kr. 20.

THE histories of 22 cases of epilepsy are considered on broadly psycho-analytic lines in an attempt to support the argument that epilepsy is a somatic reaction to psychogenic causes. Treatment by psychotherapy produced some improvement in most cases. The evidence in support of the author's argument is not convincing: though it is true that any cortical stimulus, including "psychological" and emotional ones, might be expected to change the pattern of cerebral neuronal activity and thereby enhance or decrease the likelihood of epileptic activity. In the translation, syntax and grammar are indifferent and the meaning is sometimes obscure.

The Bible and Modern Medicine

A. RENDLE SHORT, M.D., F.R.C.S., emeritus professor of surgery, University of Bristol. London: Paternoster Press. 1953. Pp. 144. 6*s*.

THIS interesting and inexpensive little book has a misleading title. It has nothing to do with the influence of the Bible on modern medicine; nor is there any modern medicine in the Bible, although it is true that the sanitary code of the Israelites was remarkably sound and almost modern in conception. The book is a survey of health and healing in the Old and New Testaments. It

is obvious that the late Professor Rendle Short gave much time and thought to the matter, and he freely consulted contemporary texts to solve a number of intriguing problems. There are chapters on leprosy, demon possession, and medical folk-lore, and accounts of attempts to diagnose the diseases that were cured by the miracles. Perhaps the most interesting chapters are those dealing with hygiene, and the diagnosis of the various diseases recorded in the Bible.

Professor Short believed, and with good reason, that the boils with which Job was smitten from the soles of his feet to the crown of his head were in fact smallpox. He thought that Hezekiah's boil was a carbuncle. It is spoken of in the singular, was evidently localised, and nearly proved fatal. The emerods that ravaged the Philistines was probably bubonic plague, and the disaster which destroyed Sennacherib's army almost overnight may well have been pneumonic plague though it is admitted that this is mainly a disease of cold climates. One very modern diagnosis concerns the accident which befell Jacob after he had wrestled with the angel. " Here is a man engaged in violent exertion, with his body bent this way and that, who is suddenly incapacitated by acute pain and lameness ' in the hollow of his thigh ' and has to limp afterwards." What is there more likely than that he had a prolapsed intervertebral disc ?

This book is best read with a Bible at hand. It is written with reverence and will delight laymen and doctors alike.

Manuel pratique de vaccination par le B.C.G.

R. MANDE, Médecin des Hôpitaux de Paris. Paris: Masson (for Centre International de l'Enfance). 1954. Pp. 200. Fr. 950.

LESS than a tenth of this book is concerned with hypersensitivity, resistance, and the efficacy of B.C.G. vaccination; for it is not a treatise on B.C.G. but a manual for those who vaccinate. The techniques of tuberculin testing and vaccination are fully described, together with the evolution of the local reaction and the rare complications. The final chapter is a useful summary; and there are several good colour photographs.

Psychology of Personality

BERNARD NOTCUTT, professor of psychology, University of Natal. London: Methuen. 1953. Pp. 259. 21*s*.

PERSONALITY, according to James Drever's definition, is " a term used in various senses, both popularly and psychologically, the most comprehensive and satisfactory being the integrated and dynamic organisation of the physical, mental, moral, and social qualities of the individual. . ." Professor Notcutt's book helps to clarify some of the vague expanses of the subject.

After a preliminary survey of the concept of personality, he divides the theories into three main groups: those using basic traits, those describing personality in terms of environmental pressure, and those describing it in terms of interaction between the individual and the environment. Trait psychologies, he remarks, are likely to emphasise what is biologically determined, inborn, and resistant to change, like the characters found in the works of Ben Jonson, Smollett, and Dickens. The systems that stress the environmental pressures describe it in terms of biological or sociological determinism, in which latter term the cultural determinism of the anthropologists is included. The third group of " inter-action " theories includes Freud and McDougall.

In the next couple of chapters the various concepts of traits, and of types and factors, are outlined and briefly discussed, and the same is done in the succeeding chapter for the deterministic theories. The light thrown on personality by the study of motivation, and of the patterns of maturation, leads on to an interesting examination of psycho-analytic defence-mechanisms viewed as personality factors. From this flows a description of psychodynamics, mainly those of the *Gestalt* school and the behaviourists; the author seems to underestimate the dynamic aspects of psycho-analytic theory.

A good description of projective methods, such as Murray's thematic apperception test and the Rorschach test, is followed by a survey of some of the work done on " men in groups " both in Britain and in the U.S.A. A short but informative discussion of the logic of validation brings us to the final chapter, in which the development of the concept of personality is traced from the early Greeks to the nineteenth-century novelists. There are several tables usefully summarising the theories of various authorities, bibliographies, and a name and subject index.

The style is crisp and readable, and the book conveys pleasantly a lot of useful information.

The Obstetrical Forceps

L. V. DILL, M.D., F.A.C.S., asst. professor of obstetrics and gynecology, Georgetown University School of Medicine. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1953. Pp. 156. 37*s*. 6*d*.

THE author of this short monograph has made a most careful study of the use of obstetrical forceps.

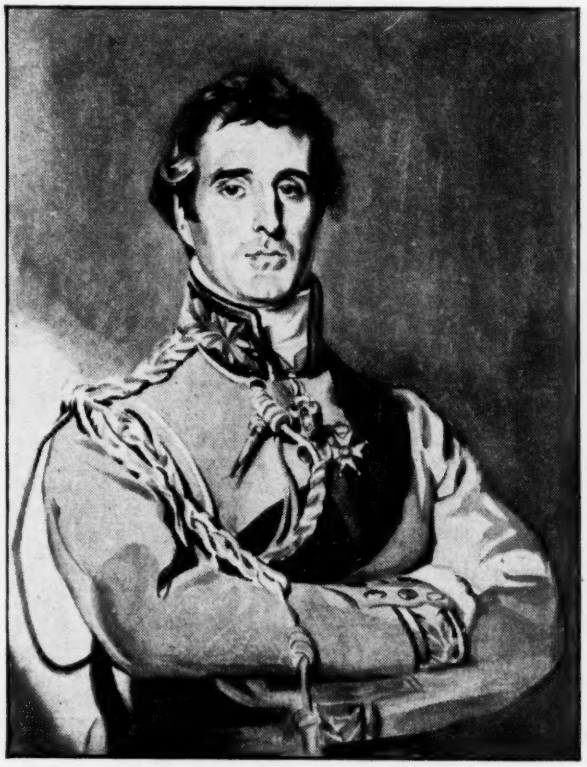
After a brief historical introduction he traces the development of the forceps, and out of the 600 or more patterns which have been described he chooses 8 as typical of the main varieties in contemporary use. These 8 are described, and the photographs of them are good although the difficulty of avoiding shadows has not been entirely overcome. There follow several chapters on indications and prerequisites for forceps delivery, and on methods of application (very clearly illustrated with drawings by Mr. John Malloy). These chapters are lucidly written but are very elementary and appear out of place in a book whose readers are encouraged in later chapters to choose an instrument most appropriate to the individual case.

Dr. Dill's arguments for having available four or five different patterns of forceps, so that an appropriate choice can be made, should be read by those who maintain that it is wiser to become thoroughly familiar with one instrument and to use it for all deliveries. Obstetricians in this country will be disappointed that the description of the development of axis traction includes no mention of Milne Murray's work.

Adaptation in Micro-organisms (London: Cambridge University Press. 1953. Pp. 339. 30*s*.).—This report of the third symposium of the Society for General Microbiology, held in London last April, is edited by R. Davies and E. F. Gale. It follows the general pattern of the series: papers reviewing outstanding aspects of adaptation are followed by ably edited reports of the discussions evoked. While much of the volume deals with adaptive enzyme formation and the development of drug-resistance in bacteria, adaptive changes in protozoa and fungi are also considered. No-one interested in this field could fail to be stimulated by the discussion of the principles underlying adaptation and their relation to bacterial ecology.

Grosse Ärzte (3rd ed. Munich: Lehmann. 1953. Pp. 440. DM. 24).—This is the third German edition of Prof. Henry E. Sigerist's renowned work. An English translation of the second edition was published in 1933 and was recognised as a scholarly and very readable book. The author, who is one of the greatest living medical historians, began his story with Imhotep and ended with Osler. He set each of the 56 biographical studies against an account of the state of medicine at the particular period, thus giving a more or less connected account of medical history over a period of nearly five thousand years. In the present edition five more studies have been added and the rest have been revised where necessary. Those newly honoured are Ramón y Cajal, Pavlov, Cushing, Von Müller, and Sauerbruch. The book is beautifully produced and lavishly illustrated. It is to be hoped that an English translation will follow.

Strapping and Bandaging for Football Injuries (London: Naldrett Press. 1953. Pp. 85. 10*s*. 6*d*.).—In this short monograph, published under the auspices of the Football Association, Mr. J. H. C. Colson, F.C.S.P., has restricted himself to describing the technique of applying support to the injured lower limb. He gives a general description of the injuries to be treated, but, as he has deliberately excluded mention of the other physiotherapeutic methods, this part does not make very satisfying reading. He gives sufficient account of the anatomy and pathology to provide a rationale for pressure-bandaging in the acute phase. His descriptions are lucid, and the line illustrations very clear, and he is to be congratulated on succeeding so well in that difficult task—describing purely technical procedures which can be learnt more quickly and effectively from practical demonstration. This book will prove most useful to physiotherapists and trainers who have athletes under their care.



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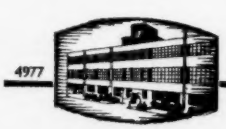

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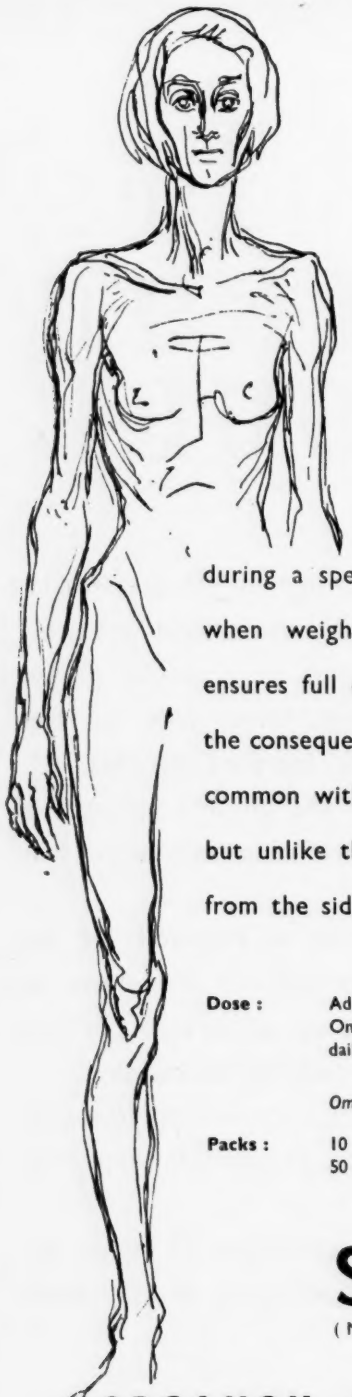

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Better General Practice

WRITTEN by Dr. STEPHEN TAYLOR for the Nuffield Provincial Hospitals Trust, *Good General Practice*[1] is described as a non-statistical survey of practices of general practitioners recognised as good doctors by their colleagues. Unlike COLLINGS[2] who described examples of different kinds of practice, and HADFIELD[3] who studied a random sample, TAYLOR deliberately sought practices of outstanding merit, in the hope that the lessons they taught could be applied to others. It was, he says, surprisingly easy to find them. He visited 30 in all—15 in industrial areas, 9 in small country towns and rural areas, and 6 in urban residential and mixed areas. These practices were run by 94 doctors, including 81 principals and 13 assistants, of whom 3 were trainee assistants. Only 3 doctors worked single-handed; 5 others who were not in partnership had assistants; and all the rest were in partnership, the number of partners ranging from 2 to 7. In devising his investigation and making his report TAYLOR was supported by a steering committee[4]; and "although the observations were the work of one individual alone, the conclusions drawn from them were not."

"On the basis of much observation and inquiry," TAYLOR suggests that the quality of general practice follows a normal distribution curve, and that the critical line below which a practice cannot be called satisfactory is such that a quarter of all practice is below it; this quarter includes "a final twentieth for which it is hard to find excuses." Though this certainly accepts a lower standard of what is "satisfactory" than COLLINGS would think right, it does not (as TAYLOR owns) justify any complacency about the present state of general practice; for if the work of a quarter of our general practitioners is for one reason or another not as good as it should be, this means that something like 10 million people cannot count on satisfactory care. Moreover, TAYLOR says—rather disconcertingly—that even among his 30 practices deliberately chosen as outstanding, not all were "universally excellent": "some could best be described as adequate, and one or two as barely adequate." Which suggests that first-class practices are not quite so easily found after all.

But whatever the faults of general practice, and however widespread they may be, TAYLOR has made a serious contribution towards putting them right; for this book is far less of a "survey," in the usual sense, than a handbook of good practice: his findings he sketches with a light pencil, but the lessons to be learnt from them are inked well in. Like COLLINGS he has found the highest level of practice in country towns, where there are usually one or more partnerships, each with its central surgery and ancillary help. At the opposite end of the scale are some of the industrial practices, in about half of which (he estimates) surgery premises are dreary and often grossly inefficient: the large well-equipped surgery is rarely seen; there are few large partnerships; and the doctor usually—and understandably—lives away from his surgery. Between these two extremes are the urban-residential practices (usually good), the few remaining private practices, the rural practices, and the practices in new housing estates. Such estates might well be used for experiments with health centres, but few such experiments have been made—usually, he thinks, because the housing authority responsible for the estate has not been the local authority. But he is not in favour of providing health centres unless there are good reasons for doing so: good group practice can offer the same advantages. Though partnerships are common, true group practice is still rare. Among those he visited, the groups included 3 or more partners and the most successful groups were likely to have not more than 7. The doctors worked from a single building, with two or more ancillaries, and each had some special medical interest. They consulted each other, seeing each other's patients on request; and they planned their work so that they had enough time off duty. There are advantages and drawbacks to the system; but on the whole TAYLOR gained the impression that the doctors in a successful group were giving a better service than they would have done if dispersed as individuals. He therefore gives much information on the forming of such groups; and, like COLLINGS,[2 5] he believes that a determined drive towards group practice in industrial areas is likely to do more good than any universal health-centre programme, if only because it could be quickly realised.

The work of individual doctors varies widely. Not only are there differences in the rate at which they work, but some under-visit while some over-visit; and some are young and active and some are old and tired. Again, there is more serious ill health in some areas than others. TAYLOR suggests that the maximum permitted list might well decrease as the morbidity of an area increases: thus, if the "average optimal list" was about 2750, the maximum in high-morbidity areas might be 2000, and in low-morbidity areas 3500, with compensating differences in the capitation fee. This would mean that the number of doctors in unhealthy under-doctored areas would be augmented; and those working in such areas would be relieved of the excessive pressure of work which makes for bad doctoring. In some areas doctors have already taken measures to relieve themselves from this kind of strain by developing rota systems, so that they can get some regular off-duty time while still providing a guaranteed emergency service for patients. This development has been possible because, under the National Health Service, they no longer feel they are in fierce competition with one another for patients. TAYLOR suggests that the optimum size of a rota is such that each member should have no more than one full night on duty a week, apart from weekends. The minimum size is thus 5, but a rota of 3 or 4 is better than no rota at all.

1. Published for the Trust by the Oxford University Press. London, 1954. Pp. 596. 12s. 6d.
2. Collings, J. S. *Lancet*, 1950, i, 555.
3. Hadfield, S. J. *Brit. med. J.* 1953, ii, 683; see *Lancet*, 1953, ii, 659.
4. The members were Sir WILSON JAMESON, Dr. GEOFFREY BARBER, Sir ERNEST ROCK CARLING, Sir HENRY COHEN, Mr. LESLIE FARRER-BROWN, Dr. J. REVANS, Dr. A. TALBOT ROGERS, and Sir JAMES SPENCE.
5. Collings, J. S. *Lancet*, 1953, ii, 31. 611, 875.

In one area without open access to hospital laboratories a doctor has organised a laboratory service, with a paid technician, for members of his rota group; and this works well. All the members share in the cost. Open access to the laboratory services in the hospitals is being granted only slowly by the teaching hospitals, and in the great cities. Yet the extra work is not excessive: clinical pathologists are surprised, they have told TAYLOR, at the small size of the addition to their load. One open-access laboratory had found that on an average one general practitioner needed 43 hours a year of a technician's time: so one technician was able to serve about 45 doctors. Doctors in a practice making good use of open access found that they asked for about 280 investigations a year for every 1000 patients on their list. A clinical pathologist can add considerably to the knowledge of practitioners in his area, especially, perhaps, if he is one of those who like to see the patient rather than the specimen. TAYLOR suggests that—since the clinical laboratory is the familiar haunt of general practitioners visiting hospital—the clinical pathologist may well become the link between them and the hospital, and may play a special part in arranging refresher courses for them.

That general practitioners should have a place, and an important place, in hospitals, TAYLOR takes for granted; but he doubts whether general-practitioner beds provide the right answer. In his opinion clinical-assistant posts probably offer the best opportunities for building up relations between general practitioners and hospital staff, and these should be available in all the main departments of all general hospitals. There are also a few specialties in which the trained and experienced general practitioner can give service comparable with that of the full-time specialist (TAYLOR cites physical medicine, dermatology, venereal diseases, geriatrics, and the care of fever patients) and others in which he can cover a substantial part of the field if not the whole. But keeping to time presents great difficulties to the part-time specialist in general practice, who should therefore not demand more than he can properly deal with.

The book offers much practical advice on surgery accommodation, equipment, and furnishing; methods of organising paper work; convenient ways of filing and storing medical record cards; ways of planning the doctor's day to avoid confusion and unnecessary fatigues; and the contents of the doctor's bag or bags—all things which closely affect performance. TAYLOR does not suggest that good doctoring is only done in handsome well-equipped surgeries, or that method is more important than humanity; but, taking it broadly, the men who have arranged their work methodically and their workrooms well can get through more without undue fatigue. The same applies to the use made of ancillaries (whether directly employed by the doctor or not): the secretary-receptionist (the helper most needed in many practices), the surgery nurse, the dispenser, the district nurse, the midwife, the health visitor, the physiotherapist, and—although she is not mentioned here—the hospital almoner. All these, used in friendship, can lighten the doctor's load, and he should use such help to the full.

As to the future, he reminds general practitioners that they can help to form it. One interesting change in recent years has been the reversion to them of many diseases which for a time they had lost to the hospitals—e.g., pneumonia, pernicious anæmia, most subcutaneous purulent infections, and most infections of the ears, pharynx, lungs, and bowels. Diabetes and thyrotoxicosis may soon belong to them again, and many another disease may yet submit to an effective drug given in the surgery. At the same time special techniques (such as mass radiography) may detect the early stages of disease long before a patient has thought of complaining to his doctor. The form of practice must be flexible enough to adapt to these and other trends in a rapidly changing society; and the future of general practice is thus rich with opportunity. If practitioners are lazy, or too attentive to their desks, their pens, and their certificates, they will lose their skills, and become relatively unimportant outposts in the hospital service. Their freedom, their right to criticise authority, make for the health of the National Health Service; but this freedom, he rightly says, must be earned and won by the standards of work and the conduct of the practitioners themselves. The alternative is organisation at the hands of others, and organisation, though not to be belittled, always carries a risk of tyranny; nor are tyrants any the less tyrants because they are well intentioned.

The book is thus a call to personal action. It is also a reference work on standards into which even the best general practitioner can dip with profit.

Abnormal Nerve Impulses

IN 1842 MATTEUCCI devised an experiment now known to many as the "rheoscopic frog." Two frog muscles with their nerves are prepared, and the nerve of A is laid across the muscle of B. When muscle B is made to contract it stimulates the nerve of A and muscle A contracts. MATTEUCCI found, also, that activity could be induced in a nerve by laying it across the beating ventricle of a frog heart.[1] In warm-blooded animals, if the phrenic nerve is placed on the ventricle of the exposed and beating heart, diaphragmatic contractions synchronous with the heart-beat may be seen.[2]

The way in which an impulse begins somewhere along the course of a nerve-fibre and not at its origin from the nerve-cell body is now partly understood. When a nerve becomes active there is a change in electrical potential between the inside and outside of the fibre. Inevitably this causes local circuits to appear, in which the direction of the current, out or in, of the active fibre must be the reverse of that of the resting neighbour alongside. One direction of current depresses excitability, the other increases it. The inactive fibre, then, is subjected to alternating differences in potential—in-out, out-in—as the circuits relating to the front and rear of the impulse pass along the active nerve.[3] Normally, endoneurium offers such resistance that the changes of potential are much attenuated before reaching the resting fibre; so the induced variations are subliminal and no impulse is propagated. Impulse propagation is accom-

1. Matteucci, C. Cours d'Électro-Physiologie. Paris, 1858.
2. Sharpey-Schafer, E. Experimental Physiology. London, 1912.
3. Arvanitaki, A. *J. Neurophysiol.* 1942, **5**, 89.

panied not only by electrical changes but also by movements of ions. As the change of potential sweeps along the nerve-fibre, so the membrane permeability of the fibre alters. First, from its mainly extracellular position sodium moves into the fibre, and potassium moves outwards. After the impulse has passed the exchange is reversed: sodium is ejected from the fibre by an active process, called the "sodium pump," involving unknown metabolic forces; and potassium then re-enters the fibre, which reverts to its resting membrane-potential. The movement of ions is minute but measurable. Although recovery is slower than impulse initiation, stores of ions are so great, and balance is so well maintained, that it is difficult to fatigue conduction in a nerve.[4] In the resting fibre next to an active one, the ionic as well as the electrical changes take place. If membrane permeability is increased—perhaps because extracellular potassium is in higher, and sodium in lower, concentration than usual—then the subliminal changes may become liminal, and the induced impulse will be propagated. Moreover, if the resting fibre is firing subliminally on its own, as is apt to happen if the concentration of ionisable calcium is low, then a nearby spike of potential-change will, sooner or later, be in phase and start a brief series of propagated impulses. After a time these die away, to reappear next time the potentials are in phase.[3] Whatever its cause, axon-to-axon transmission has been named ephaptic transmission (ἐφάπτω, I touch on or to) to distinguish it from synaptic, or dendrite to nerve-cell-body, transmission, from which it differs probably in degree rather than in kind.[3] Large potential and ionic changes occur in contracting muscle in much the same way as in nerve [5]; and under suitable conditions, as MATTEUCCI showed, these induce impulses in contiguous nerves, as in ephaptic transmission.

Do these experimental and theoretical considerations have any practical significance? The answer is Yes. LEPESCHKIN,[6] for example, draws attention to the possibility that hiccups are sometimes due to direct conduction from heart to phrenic nerve, and he refers to instances of diaphragmatic tic clearly related to heart-beat. The right phrenic nerve is in contact with the right atrium, the left phrenic nerve with both the left atrial appendage and the left ventricle. The left phrenic nerve is, therefore, in a position to be subjected to powerful stimulation. Of 5 cases of hiccups examined by LEPESCHKIN, 3 showed a clear relationship between the electrocardiographic QRS complex and the diaphragmatic contractions. The reason we do not all suffer from chronic hiccups is fairly evident: normally the nerve sheath is an effective insulator. The onset of hiccups is commonly associated with a disturbance in the ionic balance of the plasma and therefore of the interstitial fluid—for instance, after abdominal operations, when potassium is lost from the body. Such an outward flow of potassium from nerve-fibres enhances their irritability. This may also be enhanced where the potassium/calcium ratio is high, though in absolute terms both values are below normal.[7] If at the same time there is reduction of ionisable calcium, as may happen in alkalosis, the scene is set for the axonic initiation of nerve impulses. In LEPESCHKIN's cases, and in those to which he refers, either the serum-calcium was decreased or else Chvostek's sign was present. Lack of calcium leads not only to increased irritability but also to sub-threshold spontaneous firing, both of which make the nerve sensitive to nearby changes of potential. Thus it is inadvisable to correct hypopotassæmia without making sure that the patient's ionisable calcium is reasonably high, lest an attack of hiccups or tetany be precipitated.

Whether true ephaptic transmission plays an important part in the normal healthy organism, or only in disease, is unknown. Possibly it increases the number of active units in a nerve-trunk. It has been shown that local circuits may be important in the central nervous system of the frog, in which a potential-wave can cross a clean anatomical section if the divided halves are placed in contact. Local circuits may be concerned in some of the features of epilepsy, and are possibly useful in the optic area of the cortex; but in these instances, cell-bodies rather than axons may pick up the potential-changes. Our knowledge of ephaptic transmission is in its infancy.

4. Hodgkin, A. L. *Biol. Rev.* 1951, **26**, 339.
5. Keynes, R. D. The Role of Electrolytes in Excitable Tissue. Rio de Janeiro, 1951.
6. Lepeschkin, E. *Amer. J. Physiol.* 1951, **16**, 73.
7. Engel, F. R., Martin, S. P., Taylor, H. *Bull. Johns Hopk. Hosp.* 1939, **84**, 285.

Annotations

CONTROVERSIAL ISSUES

THE Scottish Committee of the British Medical Association has no very close links with the Royal College of Physicians of London; and to those who look for unity in the profession it is encouraging to see that in their memoranda of evidence to the Guillebaud Committee these widely separate representatives of medicine have taken the same line on many controversial issues.[1]

The Scottish memorandum begins by pointing out that efforts to increase efficiency and achieve economy in the N.H.S. must at all times take account of its essential nature: it differs from a business undertaking in that, while its expenses are readily ascertainable, its "profits" are neither necessarily nor immediately assessable in monetary terms. The ultimate unit of a health service is the individual, who needs first a healthy environment, secondly domiciliary care if he falls ill, and thirdly, when necessary, hospitals and specialists. To think that, because hospitals cost so much, they are the most important part of a health service is a dangerous fallacy. Hospital care will always be expensive, and economies are most likely to be found in (1) increased attention to the promotion of health and the prevention of disease, (2) better facilities for the care of the sick and infirm outside hospital, (3) the reduction in maintenance and running costs which would follow modernisation or replacement of obsolete buildings, and (4) the more efficient use of lay staff, also following modernisation of buildings. Nothing must be done in the name of efficiency or economy that would endanger the professional freedom of the doctor or the personal and confidential relationship of patient with doctor. Medicine is *not* "a sort of applied technology."

Discussing the present organisation of the N.H.S., the committee says that the choice lies between, on the one hand, improvement of the existing local mechanisms for coördinating the three parts of the

1. The memorandum of the Royal College of Physicians was published in our issue of March 13.

service, and. on the other hand, the constitution, for areas of suitable size, of authorities responsible for planning, developing, and administering the whole service in those areas. Supporters of the tripartite system are to be found chiefly among general practitioners, who value the autonomy of local executive councils and think that local coördination should suffice; but advocates of amalgamation say that the hospital authorities, the executive councils, and the public-health authorities have each worked in isolation from the other two; and, because the one active coördinating factor has been the Department of Health, they have tended to take to the department a great many difficulties and differences which would not have arisen at all, or would have been settled locally, if all the local services under the Act had come under one authority. Between these opinions the committee reaches no conclusion except that a full investigation of the organisation and administration of the service should be undertaken. It dissents, however, from proposals to simplify the administrative structure by getting rid of one of its tiers—either the regional boards or the management committees.

Turning to the argument that doctors should not be made members of administrative bodies in the N.H.S., the committee says that "in the collective medical provision which is the Health Service, it is the doctors collectively who must play the major rôle in its management and conduct if it is to realise its full potentialities for good." Rejecting the description of doctors as "interested parties" in the ordinary sense, it would evidently like to see them retain their position on boards and committees; but it also points out that no small part of the success of executive councils is attributable to the existence of statutorily recognised local medical committees which they can or must consult; and it thinks that this system should be adopted by all hospital authorities, both regional boards and management committees. The committee makes a plea for the medical superintendent—"a distinctive, traditional and valued feature of Scottish hospitals"—who is now seriously threatened by terms of service based on a quite different (i.e., English) evaluation of his importance to the service.

If it favours medical superintendents, however, the committee is very far from favouring the kind of whole-time hospital service that in many minds is associated with them. Recognising fully the value of the work done by whole-timers in many branches of medicine, it none the less believes "most strongly" that the community as a whole would suffer were the hospital service to become predominantly a whole-time one. Such a change would tend to make the public feel that doctors were medical Civil Servants and therefore not entirely free to exercise their own clinical judgment, while it would lead doctors to fear the imposition of clinical control and direction.

> "We repeat our admiration for the conscientiousness, ethics and practice of the whole-time members of hospital staffs, but we claim that their admirable work and more or less unfettered conditions derive in great measure from the parallel existence of a large, indeed much larger, body of part-time men who also provide a private medical service for those who wish it as an alternative to that provided by the State, against which the quality of the latter can be measured."

This objection to possible "economy" by imposing whole-time service is in line with what the Guillebaud Committee was told by the Royal College of Physicians. So too is the Scottish committee's belief that close central control over hospital finance often defeats its object, besides producing a sense of frustration at the periphery. Again like the college, it does not think that maintenance of hospitals could be satisfactorily financed by block grants covering several years; but it says that, with suitable safeguards, boards should be able to carry over their credit or debit balances from year to year. Capital development, which has been "totally inadequate" since the N.H.S. started, should not, however, depend on annual grants. On the vexed question of revenue from pay-beds, the committee regards it as economically unsound that hospitals "should be forced to price themselves out of what might well be a useful source of income": each board of management might be given discretion as to the charges it might make, having regard to the local competitive rate.

A false impression of the needs of the community for hospital beds is given because so many of them are occupied by elderly people who could more happily and humanely be provided for elsewhere. Indeed, in over-all numerical terms, there may be no true need for expansion of hospitals but only for modernisation and replacement. The committee does not want to see widespread adoption of geriatric specialist units as the normal form of hospital provision for old people: this it would regard as both medically unnecessary and psychologically undesirable. It envisages three kinds of institutional accommodation for the aged: (1) in the acute general hospital (ordinarily in the general ward); (2) the long-stay annexe; and (3) the hostel. All institutional care it would transfer to the hospital authority, leaving domiciliary care to coöperation between the family doctor and the local authority. In mental hospitals, as in general ones, beds are being wrongly used by senile patients who should be cared for elsewhere. Others are taken up by mentally defective children for whom other and more suitable accommodation is not available but is desperately needed.

It is good to see in this memorandum the emphasis placed on prevention. Citing the remark of the Scottish Health Services Council that "in these days the nation cannot afford sickness," the committee sets out some of the ways in which, through the public-health branch of the N.H.S., more could be done to apply existing knowledge to reducing the incidence of many diseases. Asking for a much more vigorous programme in public health, it refers not only to the lack of financial resources but also to the sense of discouragement in the public-health service, to the deficiency of salaries, and to the evidence that this work has ceased to attract doctors with the high order of capacities it demands. To put prevention in its proper place may require something like a reorientation of thought at the highest level in relation to the planning and development of the N.H.S., and (almost certainly) redeployment of resources, especially in man-power.

The Scottish memorandum concludes with an interesting remark about the real cost of drugs. As part of the cost of proprietary preparations "relates to research undertaken by the firms which produce them and to their export trade," the N.H.S. can be said to be subsidising pharmaceutical research and export. Valuable though these activities are to the community, should this kind of expenditure come within the N.H.S. accounts?

FŒTAL PANCREAS AND MATERNAL DIABETES

THOUGH it is agreed that maternal diabetes is commonly associated with hyperplasia of the islets of Langerhans in the fœtus,[1] the cause remains obscure. An obvious explanation is that the fœtus is exposed to hyperglycæmia which stimulates hyperplasia of the β cells.[2] Such a mechanism may indeed operate in many cases, but it cannot be held wholly responsible. It has been found, for instance, that there is no correlation between the degree of islet-cell hyperplasia in the infant and the mother's[3] or even the infant's[4] blood-sugar level; and

1. Cardell, B. S. *J. roy. Inst. Pract.* 1953, **66**, 335.
2. Gordon, W. H. *Ohio St. med. J.* 1936, **32**, 540.
3. Potter, E. L., Seckel, H. P. G., Stryker, W. A. *Arch. Path.* 1941, **31**, 467.
4. Helwig, E. B. *Arch. intern. Med.* 1940, **65**, 221.

Miller [5] has reported the same types of abnormality in the fœtuses of prediabetic mothers, before they had any hyperglycæmia. Another suggestion is that the mother's hormones stimulate the infant both to grow abnormally large and to have islet-cell hyperplasia.[1]

Experimental work has yielded some clues to the mechanism. Thus Hultquist's [6] diabetic rats produced oversized young with a high incidence of islet-cell hyperplasia; but the increased weight of such fœtuses was not associated with an increase in body-fat, such as might have been expected if an excess of sugar and insulin were responsible. Such fœtal oversize may be partly due to prolongation of pregnancy (which is presumably determined by changes in the hormonal milieu of the diabetic mother [7]), but this cannot be the only cause. There is some experimental evidence that pregnancy improves the diabetes of the mother,[6 8] although in man this is unusual.[3] It has been supposed that fœtal insulin reaches the maternal circulation and helps to compensate for the mother's insulin deficiency [2]; but there is no good reason for believing that insulin can cross the placental barrier. The final assumption of earlier workers was that at birth the fœtus suddenly lost the source of its extra sugar and was therefore left in a state of functional hyperinsulinism which might terminate in fatal hypoglycæmia. It is now appreciated, however, that the neonatal blood-sugar level varies considerably and may be much lower than that of the adult, but that at this age the body is relatively insensitive to the effects of hypoglycæmia.[9 10] Doubt has been expressed as to whether hypoglycæmia is especially likely in the infants of diabetic mothers [10 11]; and even if it were, the cause would not necessarily be hyperinsulinism. Perhaps when tests for plasma-insulin have been further refined, these may help to solve the problem.

SIR ANDREW DAVIDSON'S RETIREMENT

AT the end of this month Sir Andrew Davidson leaves the post in which he has done so much sound work and made so many friends. Appointed chief medical officer of the Department of Health for Scotland in 1941, he was a graduate of the public-health service, in which he had served successively in Glasgow, Surrey, and the North Riding of Yorkshire. He had both the right kind of experience and the right mental equipment for a doctor-administrator: whatever he felt he had to do, or whatever he undertook to do, he did with all his might.

Taking office early in the war, he was preoccupied with the casualty side of Civil Defence and with the conduct of the several emergency hospitals which were built in Scotland and are now incorporated in the National Health Service. At that time, Mr. Thomas Johnston was Secretary of State for Scotland, and he and Davidson formed a remarkably energetic team, with drive and imagination. For instance, the Clyde Valley experiment for restoring the health of workers on the verge of breakdown, and the scheme for reabling disabled miners, attracted attention by their originality of conception and execution. After the war his attention was concentrated on preparation for the National Health Service, and on its introduction. The N.H.S. in Scotland, operating under a separate Act of Parliament, is substantially different from the English model, and it came into operation with surprising ease. For this, Davidson deserves part of the credit; but what was more remarkable, in a man grappling with so many complexities and difficulties, was that he never mistook the new service for an end in itself, regarding it always as a means of improving the health of the people whom he knew so well.

Though so deeply immersed in policy and administration, Davidson found time to expound his ideas of future progress, and of the underlying purpose of a national health programme, which were set forth in lectures and papers chiefly published in America. Last year, with some reluctance after a lengthy illness, he undertook a series of addresses at universities in the United States and Canada. Similarly in the affairs of the World Health Organisation he has regularly played a helpful part. Indeed abroad as well as at home he has won the kind of reputation that goes only to those who combine idealism with humour and a strong mind with a warm heart. We trust that in retiring, by his own decision, from the service of his department he will not also retire from the service of Medicine.

ANTIBODY TRANSFER

THERE is little precise information about the site and the mechanism of antibody formation. In the case of bacterial cells and viruses and some other antigens, the specific antibodies are elaborated in regional lymph-nodes,[1–5]—by lymphocytes according to most American workers,[6] by plasma-cells according to Scandinavian workers.[7]

Transplantation of tissues from an immunised animal conveys to the new host the power to produce antibodies, and cells from the spleen or lymph-nodes of sensitised guineapigs give rise to sensitisation in animals to which the cells are transferred.[8] After bacterial cells and viruses had been injected into the hind-foot pad of a rabbit the popliteal lymph-node was excised and the lymphocytic cells were isolated, washed, and injected intravenously into normal rabbits. Specific antibodies to the bacterial cells and viruses appeared in the blood-stream of the rabbits which had received the injection of lymphocytes. Apparently this was not explained by the passive transfer of antibodies from the donor rabbit, nor was any detectable amount of antigen transferred.[9] Possibly antibody precursor was present in the transferred cells and the conversion of this to antibody was completed in the recipient rabbit. It seems more likely, however, that the transferred cells had been "educated" to produce specific antibodies and they continued to do so even when transferred from the immunised rabbit to the new host.

Cells from the regional popliteal lymph-node were more effective than spleen cells in conveying antibody formation. When the cells were damaged by freezing or heat, ultraviolet irradiation, or lysis they no longer produced antibodies in the recipient animal; but repeated washing had no effect on this function. After cortisone had been administered to the donor rabbits the lymph-nodes contained fewer cells; but the cells present produced antibody no less effectively than those from untreated animals. Cells obtained from animals four days after immunisation were as effective when transferred to cortisone-treated animals as in normal animals, but cells transferred only two days after immunisation were sometimes less effective in the cortisone-treated recipients. This suggests that the antibody-forming mechanism was incomplete two days after immunisation and that the cortisone interfered with its development.

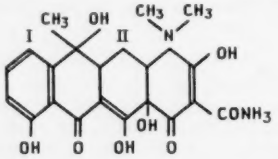
5. Miller, H. C. *Amer. J. med. Sci.* 1945, **209**, 447.
6. Hultquist, G. T. *Acta path. microbiol. scand.* 1950, **327**, 695.
7. Snyder, F. F. *Bull. Johns Hopk. Hosp.* 1934, **54**, 1.
8. Carlson, A. J., Orr, J. S., Jones, W. S. *J. biol. Chem.* 1914, **17**, 19.
9. Pedersen, J. Blood Sugar of Newborn Infants during Fasting and Glucose Administration. Copenhagen, 1952.
10. Komrower, G. M. *Arch. Dis. Childh.* 1954, **29**, 28.
11. Potter, E. L. Pathology of the Fetus and the Newborn. Chicago, 1952; p. 343.

1. McMaster P. D., Hudack, S. S. *J. exp. Med.* 1935, **61**, 783.
2. Burnet, F. M., Lush, D. *Aust. J. exp. Biol.* 1938, **16**, 261.
3. Ehrich, W. E., Harris, T. N. *J. exp. Med.* 1942, **76**, 335.
4. Dougherty, T., Chase, J., White, A. *Proc. Soc. exp. Biol., N.Y.* 1944, **57**, 295.
5. Oakley, C. L., Warrack, G.H., Batty, D. *J. Path. Bact.* 1949, **61**, 179.
6. Harris, T. N., Grimm, E., Mertens, E., Ehrich, W. E. *J. exp. Med.* 1945, **81**, 73.
7. Fagraeus, A. *J. Immunol.* 1948, **58**, 1.
8. Chase, M. W. *Fed. Proc.* 1951, **10**, 404.
9. Harris, S., Harris, T. N., Farber, M. B. *J. Immunol.* 1954, **72**, 148, 161.

There is therefore strong evidence for the view that an antibody-forming mechanism resides in lymphocytes present in lymph-nodes, and that this immunity mechanism persists even when the cells are transferred to a new host. Presumably the persistence of antibody formation long after the antigenic stimulus is withdrawn may be due not to the longevity of lymphocytes but to the continued production in the lymph-node of antibody-producing lymphocytes.

TETRACYCLINE

CHEMICALLY chlortetracycline (aureomycin) and oxytetracycline (terramycin) are closely related [1 2]; and a new antibacterial substance, tetracycline ('Tetracyn'), has been shown to be the basis of both. Tetracycline has the structure:



Chlortetracycline is formed by the addition of a chlorine atom to the carbon atom I in tetracycline, and oxytetracycline by the addition of a hydroxyl group to the carbon atom II. In practice tetracycline is prepared by the catalytic hydrogenation of chlortetracycline.[3 4]

The value of tetracycline has been assessed by Finland et al.,[5] who have compared it with its two derivatives. Tetracycline is much more stable in solution than chlortetracycline or oxytetracycline. A concentration of 8 μg. per ml. in physiological saline solution retained its full antibacterial potency for three weeks at 5°C, whereas a similar preparation of chlortetracycline had deteriorated considerably after twenty-four to forty-eight hours, and of oxytetracycline after a week. The antibacterial activity of the three antibiotics was compared for 257 recently isolated strains of common pathogenic bacteria. Most strains were more or less equally sensitive to tetracycline and oxytetracycline, but about half of them seemed to be less sensitive to chlortetracycline than to tetracycline. This relatively lower activity of chlortetracycline must be due, at any rate partly, to the deterioration of the drug during the incubation period required by the sensitivity test. As regards individual species, tetracycline seemed to be the most active against *Escherichia coli*, *Shigella sonnei*, and proteus; oxytetracycline against *Pseudomonas pyocyanea*; and chlortetracycline against the enterococcus, *Staphylococcus aureus*, and *Streptococcus viridans*. These differences, however, were seldom great, and in general there was little indication that any one of the analogues was specifically indicated in preference to the others for any particular organism. Bacteria that were highly resistant to any one of the drugs always showed about the same resistance to the other two; and, as might be expected, the artificial increase of resistance of an organism to one drug always coincided with a similar increase of resistance to the other two. There was, in fact, complete crossed resistance between them.

Blood-levels of tetracycline, oxytetracycline, and chlortetracycline were compared in 12 volunteers, each of whom received 1 g. of each antibiotic by mouth at different times without knowing which he was taking. With all three agents peak levels were reached after four to six hours and ranged from 1 to 4 μg. per ml. of plasma. These levels were sustained until eight to twelve hours after the dose was taken. The average levels for all the subjects were highest with tetracycline and lowest with oxytetracycline. In patients receiving 0·5 g. of tetracycline every six hours the peak levels were reached after the second dose and ranged usually from 1 to 8 μg. per ml. of plasma, though occasionally this dosage gave levels of 16 μg. per ml. Tetracycline, like its two analogues, is excreted rapidly in the urine. Two hours after administration of 1-g. doses Finland et al. found urinary concentrations ranging from 20 to 320 μg. per ml.; 9–21% of the ingested dose was excreted in the urine during the first twelve hours, and a further 4–7% in the next twelve hours. Tetracycline concentrations in the cerebrospinal fluid were determined in 7 patients. In 5 no activity was demonstrable, while in the remaining 2 the levels were $^1/_8$ and $^1/_{32}$ of the simultaneous blood-levels.

Tetracycline was tested clinically in 179 patients, the majority of whom had infections of the urinary or respiratory tract. Most of the patients received 0·5 g. by mouth every six hours for four to ten days, the average total dose being 10·7 g. in seven days. The responses of these patients to tetracycline were in every respect similar to those observed with oxytetracycline and chlortetracycline. Of 14 acute urinary-tract infections, 11 (10 caused by *Esch. coli*, 1 by *Staph. aureus*) showed an excellent response. The remaining 3 (1 *Esch. coli*, 1 enterococcus, 1 proteus) were all improved. Acute exacerbations of chronic urinary infections, mostly associated with irremediable obstructions or indwelling catheters, did not as a rule respond so well. Similar results were obtained with respiratory infections. Patients with acute pneumonia, mostly pneumococcal, responded well, while those with chronic bronchopulmonary suppuration showed variable, but seldom spectacular, results. Of a number of miscellaneous infections, good responses were obtained in each of 6 hæmolytic streptococcal sore throats, 3 staphylococcal septicæmias, 1 meningococcal meningitis, 1 Sonne dysentery, and 1 suppurative otitis media.

These results are no better and no worse than might be expected from treatment with oxytetracycline or chlortetracycline, but tetracycline seemed to be definitely superior in respect of side-effects.[6] These were limited to gastro-intestinal symptoms, and were distinctly less frequent and less severe than those noted in a comparable study of oxytetracycline and chlortetracycline. Only 14 of 179 patients experienced any discomfort, which varied from flatulence to nausea, vomiting, and diarrhœa. In no instance were these symptoms so severe that treatment had to be discontinued. The tetracycline was administered to some of the patients in capsules and to others in tablets, and 10 of the 14 who experienced side-effects were in the group receiving tablets.

It will be some time before tetracycline is fully evaluated. Its introduction does not seem to be a dramatic advance in antibacterial therapy; but it is valuable to have a broad-spectrum antibiotic which seems to cause unpleasant side-effects so seldom.

THE ROYAL SOCIETY

AMONG the men and women who last week were elected F.R.S. are three whose association with medicine is closer than that of many doctors. Professor Bradford Hill has repeatedly put us all in his debt by his brilliant use of common sense; Professor Rimington is a leading authority on blood and bile pigments, porphyria, and thyroid metabolism; and the remarkable work of Mrs. Pitt-Rivers on triiodothyronine is fresh in the memory. The pleasure we take in these elections is some compensation for the absence of any strictly medical name from this year's list. But, in case this absence should in fact be another sign of the times, we venture to express a hope that the society, with its great tradition of integration, will never come to regard clinical studies as outside the borders of science.

1. Waller, C. W. et al. *J. Amer. chem. Soc.* 1952, **74**, 4981.
2. Stephens, C. R. et al. *Ibid*, p. 4976.
3. Boothe, J. H. et al. *Ibid*, 1953, **75**, 4621.
4. Conover, L. H. et al. *Ibid*, p. 4622.
5. Finland, M., Purcell, E. M., Wright, S. S., Love, B. D., Mou, T. W., Kass, E. H. *J. Amer. med. Ass.* 1954, **154**, 561.
6. See *Lancet*, 1953, ii, 1246.

Special Articles

OBSTETRICS AND THE GENERAL PRACTITIONER

An Account of the Maternity Work of a Rural General Practice in a Cottage Hospital

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"... it can be calculated that in England and Wales the number of babies killed by injuries received during birth (stillbirths and neonatal deaths) in any one year is approximately twice the total number of deaths, adults and children, in road accidents."

"It is thus apparent that a more general application of present-day knowledge of obstetrics and pædiatrics by the medical and nursing professions and by those responsible for social services and for administering hospital and domiciliary midwifery services would result in a further considerable reduction in the neonatal mortality rate. Similarly, if every pregnant woman received first class medical and nursing supervision during pregnancy and labour, the stillbirth rate could also be appreciably decreased.

"The evidence goes to show that the present neonatal mortality and stillbirth rates could be reduced by one-third to one-half, and if they were, there would be a saving of about 15,000 babies each year in England and Wales alone."

(*Neonatal Mortality and Morbidity* 1949.)

THERE has been much discussion on the general practitioner's rôle in the maternity services. More women are wishing to have their babies in hospital; the local-authority health services, with their clinics and district midwives, are responsible for much of the domiciliary work; but it is widely felt that the family doctor should still play the principal part.

"Midwifery should be regarded as a normal province of the G.P. and the present tendency to divorce the G.P. from the practice of midwifery is deplorable, as it removes from the scene the one individual who is likely to be most informed on the past history of the patient and most closely acquainted with her health, temperament and domestic circumstances. It is absurd to pay lip service to the extreme importance of the family doctor and then deprive him of the opportunity of attending his patient at a time when the value of his association with the patient and her family is at its highest to them."

(*British Medical Journal* 1950.)

Also it is feared that the patient's welfare will fall between the three bodies concerned in maternity work—the hospital authority, the local authority, and the local executive council.

Although both maternal and fœtal mortality-rates are lower than ever before in this country, the quotations at the head of this article emphasise that much remains to be done to make childbearing safer for mother and infant. Every year in England and Wales 15,000 babies die who might have been saved by "more general application of present-day knowledge of obstetrics and pædiatrics," and in 1950 there were 622 maternal deaths, in some 35% of which there was an "avoidable factor" (Ministry of Health 1950). If the general practitioner is to take a larger share in maternity work, much of the responsibility for preventing this avoidable loss of life will fall on him. This duty cannot be discharged efficiently in domiciliary isolation: essential for better obstetrics are a closer integration of general-practitioner and consultant services and the provision of hospital beds for practitioners.

These conditions are best created by the formation of area departments, consisting of a central obstetric hospital staffed by consultants, and peripheral maternity homes staffed by general practitioners. The principle of area departments has been accepted by the board of governors and regional board in the Oxford region, and in other specialties besides obstetrics these departments have now been in operation for some years. In the area department of obstetrics peripheral units are situated in cottage hospitals or (in the towns) in nursing-homes or in the parent hospital. These beds are a great incentive to the keen practitioner, and by bringing him into much closer association with his colleagues they break down his sense of isolation and improve his standard of work. The value of cottage hospitals, both to doctors and to patients, is not generally recognised. To exclude general practitioners from them, as has been the policy of some regional hospital boards, is a major administrative blunder, which should be corrected as soon as possible.

Endorsing the opinion that hospital beds should be available to general practitioners for maternity work, the General Practice Review Committee of the British Medical Association said:

"These beds, forming maternity units for cases which clinically could be domiciliary cases, need not be in general hospitals and need not carry the full established staff of a specialist maternity unit. The midwife who would have attended in the home would attend the case in such a unit. Consultant advice should be readily available if required by the general practitioner. The Committee believes that, by this provision, the expectant mother would receive adequate care during her confinement. Such provision may have the additional advantage of reducing the present high cost of institutional confinement."

(*British Medical Journal* 1953.)

Our purpose here is to give an account of the maternity work done by practitioners in a rural cottage hospital, where conditions closely correspond to those recommended by the committee.

Organisation

The cottage hospital was founded in 1870 and extended in 1935. It is situated in a small country town and serves an agricultural area. The doctors of four practices use it and they undertake maternity work on behalf of colleagues in neighbouring practices.

There are, in all, 32 beds in the hospital, of which one ward of 8 beds and 2 single-bed side wards are used for maternity patients. The single labour ward adjoins the ward and is reasonably soundproof. It is equipped with a Chassar Moir bed, good lighting, an 'Oxford Vaporiser' for analgesia, a Coxeter-Mushin anæsthetic machine, and a comprehensive selection of instruments for delivery, the forceps operation, repair of lacerations, and surgical induction. The operating-theatre is opposite the labour ward and can be used for cæsarean section. There is no room equipped as a nursery, and no facilities for rearing delicate premature babies.

The department is in the care of a sister and a charge nurse, who are qualified S.R.N. and S.C.M., assisted by one part-time nurse and three unqualified assistant nurses.

A single printed pro forma is used for keeping notes about each patient. One side of this has sections for the observations made at the antenatal visits, during labour and in the puerperium. The other side bears the temperature chart for the puerperium and the baby's weight chart. These forms are filed and kept in the hospital.

The hospital has an X-ray department, and visiting radiologists from the regional hospital report on the films taken by the radiographer. It was from this department that Dr. Clark Nicholson made his valuable contributions to the subject of precision methods of X-ray pelvimetry. Perhaps equally important, it was in this hospital that Dr. Nicholson put his radiological views to the test of clinical practice in the obstetric wards, where, with the visiting consultant obstetrician, he sought to find without

bias the place of X-ray pelvimetry in obstetrics (Nicholson 1938, Nicholson and Allen 1946).

A consultant obstetrician visits the hospital once a fortnight to see any cases that the practitioners wish to refer to him.

The regional blood-transfusion centre is 30 miles away but can supply blood within an hour of a request. Cross-matching can be done in the cottage hospital. Bottles of dextran are kept for use in an emergency while the blood is on the way.

ANTENATAL AND POSTNATAL WORK

The hospital outpatient-room is used for the antenatal clinic; both morning and afternoon of one day are devoted to this each week, the day being chosen to fit in with the local bus services. The clinic is organised by the sister in charge of the department and there is ample time for two doctors to see thirty patients and spend as much time as is needed for discussion and explanation. The patients are seen monthly until the 28th week, fortnightly until the 36th week, and thereafter weekly until term. A blood-pressure reading, urine test, and abdominal examination are recorded at each visit. At the first visit a general examination is made, and blood is taken for ABO and Rh grouping, and for hæmoglobin estimation. The hygiene of pregnancy, care of the breasts, treatment of sickness, and the importance of a good mixed diet are explained.

At the 36th week the pelvis is assessed clinically, the hæmoglobin is checked, and the nature of normal labour is explained; the analgesia apparatus is demonstrated, and the other methods of relieving pain are mentioned. In uncomplicated cases the woman is reassured that the pregnancy is in every way normal and that she is able to look forward to a normal labour, as comfortable as it can be made for her.

As will be emphasised later, to the general-practitioner obstetrician careful antenatal work is of paramount importance; he must be a first-class antenatal clinician. Antenatal work should be done at the institution where the practitioner has beds and by the people who will attend the patients during labour; this arrangement enables patients to get to know the team of doctors and nurses who will be seeing them through their confinements and to become familiar with the surroundings. It also enables two or more doctors to see their cases together and get an exchange of views.

Postnatal examinations are made on the same day as the antenatal clinic is held. Each patient is given an appointment before she leaves the maternity ward, and the importance of attending is explained to her. The cervix is examined with a speculum and the presence of erosions is noted, for treatment later if necessary. The perineum is inspected, a vaginal examination is made, and contraception, feeding problems, and any other sources of anxiety are attended to.

CONDUCT OF LABOUR

So far as possible each case is examined on admission by the general practitioner. Most of the normal multigravidæ are delivered by the sister or charge nurse, while the doctor is in attendance to assist with analgesia and deal with any abnormality that may arise.

The Oxford vaporiser containing ether is used for analgesia during the end of the first stage and throughout the second: in our experience it is an extremely useful instrument, provided that the concentration of ether is not allowed to exceed 2%. It is easy to induce temporary unconsciousness, as the head is crowned, by raising the concentration to 10–15%.

For forceps deliveries full anæsthesia is provided with the Coxeter-Mushin machine with nitrous oxide, oxygen, trichlorethylene, and ether.

Ergometrine 0·5 mg. is given intravenously with the delivery of the anterior shoulder in cases under anæsthesia, or in cases with a history of postpartum hæmorrhage in the past, or in the presence of anæmia or abnormalities predisposing to hæmorrhage.

The Value of the General-practitioner Maternity Home

VALUE TO THE PATIENT

It should be the aim of the obstetrician to provide the expectant mother not only with the greatest physical safety but also with the highest degree of confidence, security, and emotional satisfaction. During the antenatal period as much care should be taken with psychological as with physical factors. It is as reprehensible that a primigravida should come to term without a full explanation of the onset and course of labour as is neglect of blood-pressure readings, urine tests, and examinations for disproportion.

There is no doubt that to most women the home provides the best setting psychologically for childbearing, and the present tendency towards hospital confinement is the result of the housing situation, the difficulty in getting domestic help, and the confidence that confinement in hospital is safer than at home, should anything go wrong.

> "The general indication from this study is that many women would prefer a good domiciliary maternity service, provided that some domestic help was available and housing were improved." (*Maternity in Great Britain* 1948.)

It is not our view that all confinements should take place in hospital, or that maternity homes should be provided to the exclusion of domiciliary midwifery. We are well aware of the fine work done by district midwives, whose high standards have done much to improve the maternity service. As is emphasised in the report of the B.M.A.'s General Practice Review Committee, it is most regrettable that misunderstanding and resentment should come between the general practitioner and district midwife. As is true in all branches of medicine, it is the patient who suffers when her attendants fall out among themselves. It is hoped that by giving district midwives a position in practitioner maternity homes competition between them will be removed and more harmonious relations established.

It is our policy that admission to the cottage hospital is arranged for mothers having their first babies and for multiparæ when indicated on medical grounds. Otherwise the choice lies with the patient. The majority of our patients prefer to come to hospital, for social reasons, many living in caravans or hostels. The value of the general-practitioner maternity home is that women who would otherwise have to be admitted to a busy consultant centre can be attended in hospital by their own doctors, without the disadvantages necessarily associated with the big institution. The big, busy obstetric centres have succeeded in making childbirth safe for a large number of women for whom it would, in other circumstances, have been hazardous. Where delivery is difficult, the prospect of success is greatest in a specialist hospital; and it is the practitioner's duty to see that the patient is sent there in the best possible condition; but these hospitals do not provide the best setting for the normal confinement.

The bustle and noise, the distress of other women in labour, and the presence of the abnormal, which are features of big institutions, are harmful, and the normal patient, especially the young primigravida, should not be exposed to them. At present too many abnormal cases are being delivered outside the specialist centres and too many normal cases in them. In the overcrowded clinics of some busy obstetric hospitals there is so little time for education and advice that antenatal care is reduced to bare necessities. Patients often have too far to come and too long to wait, while the impressionable primigravida is

frightened by the reminiscences of the more imaginative multipara.

The small maternity home staffed by general practitioners should be able to give the patient more understanding and individual attention, both during the antenatal period and during labour, than can the obstetric hospital. It is of great help to the patient if during the antenatal period, in an unhurried way in familiar surroundings, she can discuss her problems with her family doctor. Similarly, in a small institution one can provide the two conditions so important to the woman in labour—that she should be cared for by people she knows and that she should not be left alone. In the maternity home we are describing it is unusual for more than one woman to be in labour at a time; so it is usually possible for someone to be with her, at least during the latter part of the first stage and throughout the second. We believe that such a setting creates as intimate an atmosphere as can be obtained outside the patient's home.

THE VALUE TO THE DOCTOR

To the busy general practitioner the advantages of having hospital facilities for his maternity work are immense, as will be recognised by anyone who has had experience of conducting a forceps delivery, repairing a lacerated perineum, dealing with a postpartum hæmorrhage, or resuscitating an asphyxiated babe in a private house. Good equipment, lighting, anæsthesia, and the assistance of resident nurses save wear and tear and prevent the standards of work falling because of poor surroundings and isolation. The practitioner unit provides common ground on which practitioners may meet, see cases together, and exchange ideas, helping to overcome these dangers. This is all to the patients' benefit.

Such surroundings may be intellectually stimulating and conducive to original work. The pioneer work of Dr. Clark Nicholson in this hospital, as described above, is a notable illustration.

Limitations and Dangers

The danger, of course, is that the general-practitioner maternity home may become independent and self-sufficient and that its staff may be tempted to tackle abnormal obstetrics, which should be in the hands of a specialist obstetrician. Whether in a cottage hospital at the periphery of a hospital region, or in a unit attached to the parent hospital, the practitioner unit must work in close contact with the specialist hospital. Integration of centre and periphery into a combined service is essential to a safe maternity service. The practitioner must recognise his own limitations and those of the setting in which he works; for, if any abnormality arises which he cannot safely tackle, it is his duty to his patient to ensure that she is sent to expert hands in good condition. In the small maternity practice abnormalities come infrequently, and it is easy to be lulled into an optimistic attitude of "this doesn't happen to me." Moreover, unless one watches the figures closely, it is possible to be satisfied with maternal and fœtal death-rates higher than those of the country as a whole.

Close association between the general practitioner and the specialist is recognised as being valuable to both and is much discussed. Yet little is done about it, and many practitioners lose sight of their patients when they go to hospital. During the six months that one of us spent in a resident post in an obstetric hospital doing 950 deliveries a year, no general practitioner was known to have come to visit a patient—perhaps through reticence or unwillingness to bother busy nursing and medical staff. If practitioners are to make childbearing safer for their patients they should see inside the institutions to which they send abnormal cases and should know what problems the obstetrician thinks should be referred to him. It is the practitioner's duty to his patient to keep up to date: now that general practice is as well remunerated as any branch of the profession, lack of time cannot be accepted as a reason for being out of touch with the current knowledge of obstetrics.

While the initiative must lie with the practitioner, efforts to bridge the gap between doctor and hospital must be made from both sides. The consultant should accept as part of his responsibility the postgraduate education of the general practitioners in his area; and it is to his advantage to do so, since the number of mismanaged cases sent as emergencies will be reduced. Practitioners should be made to feel welcome on ward rounds, at conferences, and at the delivery of their patients; they should be made to feel that the freedom of the wards is theirs.

The regular visit of consultants to general-practitioner maternity homes is valuable and stimulating, and the joint discussion of cases is a very helpful way of keeping up to date.

Though the attempt to foster a class of general-practitioner obstetricians with special interests and qualifications has not proved acceptable to the profession, postgraduate experience is essential to the practitioner who is to contribute to a safer maternity service. Though it may be true in principle that a medical qualification licenses a man to practise obstetrics, the newly qualified doctor is in fact no better equipped for this than for major surgery. This is a matter for the conscience rather than for legislation.

Individual Obstetric Problems

Toxæmia of Pregnancy

Toxæmia of pregnancy is common. In our experience 29% of our patients have had a diastolic pressure of 90 mm. Hg, or more, and 10% one of 100 mm. or more. In 1950, 101 of the 520 maternal deaths in England and Wales investigated in detail on form 97 M.C.W. were due to toxæmia (in the broadest sense of the term) (Ministry of Health 1950). Various authors attribute from 10 to 21% of stillbirths directly to toxæmia, and many stillbirths and neonatal deaths in premature infants are indirectly due to toxæmia. That much of this maternal and fœtal mortality is unnecessary is shown by the work of the Women's Hospital, Sydney, where careful antenatal supervision has virtually abolished eclampsia (Hamlin 1952).

The management of toxæmia illustrates the need for effective coöperation between practitioner and consultant. It is the practitioner's responsibility to recognise toxæmia early and to prevent it becoming severe. We suggest that in the pregnant woman a systolic blood-pressure of 140/90 mm. Hg at rest is abnormal, even in the absence of albuminuria, and demands rest in bed and sedation with close daily observation; and we believe that if this were recognised throughout the country the incidence of severe toxæmia and eclampsia would be greatly reduced. Treatment of such minor degrees of toxæmia is often neglected both by the patient, who feels perfectly well, and by the doctor, who regards such blood-pressures within the limits of normality. The importance of treating toxæmia in the early stages is emphasised by Browne (1951) and Hamlin (1952). The practitioner unit should have enough beds to provide antenatal treatment of this kind, and by doing so would relieve the demands on beds in the specialist hospital. With more severe degrees of toxæmia specialist advice is needed, and in our view any patient with a blood-pressure of 150/100 or higher, which does not settle with rest in bed, should be referred to a specialist, unless she is so near term and the head is so deeply engaged in the pelvis that labour can be safely and surely induced.

Hæmorrhage

In 1950 in England and Wales 46 women lost their lives in childbirth because of hæmorrhage, and a third of the total maternal deaths were due to hæmorrhage and shock (Ministry of Health 1950). It is essential that blood-transfusion be easily available in practitioner units; either an arrangement must be made with the regional blood-transfusion centre to supply blood in an emergency for the general practitioner to cross-match and give, or the parent obstetrical hospital must provide a flying squad.

In our practice cases of antepartum hæmorrhage are sent to the specialist hospital as emergencies without a preliminary vaginal examination.

Postpartum hæmorrhage can be dealt with quickly and safely in well-equipped surroundings. In cases of retained placenta we resort to manual removal promptly, before the patient has become shocked.

The Forceps Operation

In a private house the forceps operation is an ordeal which most general practitioners would gladly forgo. In a properly appointed labour ward it can be done more easily and safely, with full aseptic precautions.

We regard a low forceps delivery in a prolonged second stage as being within our province, but a difficult rotation of a posterior position in an awkwardly shaped pelvis is a major operation more safely performed by an obstetrician. The high forceps operation has no place in modern obstetrics, and we think that trial labour should be conducted by the consultant obstetrician in the central obstetric hospital. In this, as in many other problems, our skill must be directed towards picking out these cases in the antenatal period or in early labour and seeing the patient safely into specialist care—not towards heroic obstetrical manœuvres which are too difficult for us.

Disproportion

A careful assessment of the pelvis at the 36th week is an essential part of antenatal care of the primigravida. Wherever the findings suggest a small pelvis, or where the head cannot be made to engage in the pelvis when the bowel and bladder have been emptied and with the patient sitting or standing, we ask for X-ray pelvimetry. As we have said, we think that trial labours should always take place in a specialist hospital.

Prolonged Labour and the Posterior Position

The prolonged inert labour of the posterior position, with premature rupture of the membranes, ketosis, and risk of infection and fœtal distress, terminated by a difficult rotation and forceps delivery, is the commonest unforeseen complication which the general practitioner may have to deal with. These cases are best treated in a specialist centre, and it is our practice to send in any case in which, after twenty-four hours of labour, there is no prospect of delivery in a few hours.

It is our impression that inertia is relatively less common in the more peaceful atmosphere of a small maternity home than in the larger hospital.

Breech Delivery

The management of the breech presentation during the antenatal period and during labour calls for fine judgment, and cases for delivery in a general-practitioner maternity home must be carefully selected. When external version is unsuccessful, we ask the consultant obstetrician to see the patient with a view to version under general anæsthesia—a procedure with its own hazards.

If it is thought advisable to allow the fœtus to be delivered as a breech, careful clinical and radiological assessment of the size of the pelvis is undertaken. If there is any suggestion of disproportion or other unfavourable feature it is in the woman's interests that she be confined in the obstetric centre.

Multiple Pregnancy

The risk of premature labour is diminished if women carrying twins can be admitted for a fortnight's rest in bed at 32 weeks and readmitted from 37 weeks until delivery. Premature labour with multiple pregnancy should be conducted in a specialist hospital, since the risk to the infants is great.

The Premature Infant

The premature baby is a poor risk in a small institution where the special surroundings and skill are not available. As Professor Lennon has written, "the best 'flying squad' container for the premature baby is the mother's uterus," and all premature labours where the infant seems small should be conducted in a specialist centre, where every precaution can be taken to save the fœtus damage during delivery, and where the staff are experienced in handling premature babies.

The prevention of prematurity is an important aim of antenatal care. It has been shown that in 36–52% of cases of prematurity the cause is unknown, while toxæmia and twins account for most of the rest. Adequate diet and rest, and the early recognition and treatment of toxæmia, would by themselves lower the stillbirth and neonatal death rate considerably, since premature babies make up almost half the stillbirths and over half the neonatal deaths.

Associated Maternal Diseases

With the fall in the maternal death-rate that has followed the control of puerperal sepsis and to a lesser degree hæmorrhage, deaths due to associated maternal diseases are assuming greater importance. In 1950, of the 520 maternal deaths in England and Wales reported in detail, 101 were due to maternal conditions (Ministry of Health 1950). Pulmonary, cardiac, or other disease of the mother is an indication for delivery in specialist hands.

Conclusions

The principal part in the national maternity service should be taken by the family doctor, supported by the consultant obstetricians and district midwives.

The general practitioner cannot improve his present standard of obstetrics unless he is provided with better working conditions.

General-practitioner maternity homes, constituting part of an area department and working in coöperation with the parent hospital, afford congenial conditions for the patients and are a great incentive to the doctor. The best conditions must be provided for careful antenatal work, which is essential for safe obstetrics. The general-practitioner obstetrician must be aware of his limitations and trained to notice the abnormal in its earliest stages.

Such a working arrangement is illustrated by an account of the organisation and work of a rural cottage hospital. The results of the last five and a half years' work are included as an appendix.

It is a pleasure to thank many friends for their help. Mr. H. Sandeman Allen and Mr. J. Stallworthy have contributed largely to the development and smooth running of the maternity home, and we can look back with gratitude over years of effective and stimulating coöperation. They have given us encouragement and advice in writing this article.

Prof. G. Gordon Lennon, Mr. W. G. MacGregor, and Mr. E. A. Williams have read the typescript and helped us in many ways.

Much of the credit for the work described in this article should go to Sister J. Pye, S.R.N., S.C.M., and her staff. They have given us loyal and expert help and it has been a pleasure to work with them.

Appendix

The following is an analysis of the work done in the cottage hospital by one partnership between January, 1947, and June, 1953, inclusive. The figures include all the booked cases and a small number of emergencies under our care during this period. Cases that were transferred to a specialist hospital in

the antenatal period and during labour are included, since we feel that they are, to a certain extent, still our responsibility.

TOTAL NUMBER OF PREGNANCIES SUPERVISED		566	
Primiparæ	223		
Multiparæ	343		
TOTAL NUMBER OF INFANTS BORN		574	
Live births	565		
Stillbirths	9		15·7 per 1000 total births
NEONATAL DEATHS		4	7·1 per 1000 live births
MATERNAL DEATHS		0	
FORCEPS DELIVERIES		87	15% of total births
BREECH DELIVERIES		8	
LACERATIONS			
First and second degree		169	
Third degree		1	
Episiotomy		64	
POSTPARTUM HÆMORRHAGE (This is an approximation, since the blood lost was not routinely measured.)		55	
MANUAL REMOVAL OF THE PLACENTA		6	
BLOOD-TRANSFUSION		2	
CÆSAREAN SECTION (One of these was performed in the cottage hospital, the rest in a specialist hospital.)		6	
PUERPERAL PYREXIA			
Above 100·4°F on any occasion		41	
99°–100·4°F		267	
TOXÆMIA			
Diastolic blood-pressure 90–99 mm. Hg		110	
" " " 100–109 mm. Hg		46	
" " " 110 mm. or above		12	
POSTNATAL ATTENDANCES Of the last 100 patients, 88 attended postnatally, 2 of the 12 who did not, having left the district.			
CASES REFERRED TO A CONSULTANT			
Seen by a consultant in the cottage hospital		51	9% of total pregnancies
Transferred to a specialist hospital		35	6% of total pregnancies
Reasons for transfer :			
Disproportion	9		
Toxæmia	5		
Breech	4		
Placenta prævia	3		
Essential hypertension	3		
Posterior position	2		
Bed shortage	2		
Unstable presentation	2		
Face presentation	1		
Postmaturity	1		
Prematurity	1		
Erythroblastosis fœtalis	1		
Previous cæsarean section	1		

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EARLY CARE OF THE DEAF

A SCHOOL FOR MOTHERS

HEARING is a matter of interpreting signals. Any deaf child who has a trace of hearing left, however small, will get some signals; but because they are reduced—often grossly reduced—compared with those reaching other people he finds great difficulty in interpreting them, and is soon apt to disregard them altogether. What begins as a severe degree of organic deafness may become, through neglect, a complete functional deafness—for there are none so deaf as those who won't hear. Last week Miss Edith Whetnall, F.R.C.S., and Mr. D. B. Fry, PH.D.,[1] demonstrated the importance of training deaf children very early in life to make full use of their residual hearing. As they pointed out, we learn to interpret speech very young. Children of a few months are able to distinguish much from the tone of the voice, and by the end of the second year of life can use quite a large vocabulary of single words and are beginning to construct simple sentences. They have a still wider vocabulary of words and phrases which they understand without attempting to use them. This feat is so familiar to us that we hardly realise how truly remarkable it is. The deaf child who is not taught young to use what hearing he has misses this important phase, in which the powers of attending to and interpreting auditory signals are extraordinarily acute. But who is to teach him, other than his mother? And how is the mother to acquire the quite complex technique of giving him signals he can follow?

1. *Lancet*, March 20, 1954, p. 583.

HEARING-AIDS

The Royal National Throat, Nose and Ear Hospital has established at Ealing a small school for such mothers—the Hostel for Deaf Children and their Mothers—under the direction of Miss Whetnall. In a comfortable house with a garden, the mothers come with their children to stay for three weeks at a time. Four or five can be in residence together, and they have continuous tuition and practice in getting their children to understand, and perhaps begin to copy, speech. If the mother can give her child this good start, he reaches his school for the deaf, at the age of four or five, with some of his work behind him: he has learnt to lip-read, and he is beginning to try his tongue at speech. Moreover he is familiar with the use of a hearing-aid, and is therefore using what hearing he has.

It is not perhaps generally realised that small children are very amenable to the use of a hearing-aid. They accept, without demur, a small plastic earpiece, and do not—as might be expected—continually pull it out. If a child is to wear one steadily, however, he needs a simple harness to carry the microphone and battery bag. Such a harness, easily made at home, has been devised by the Deaf Children's Society, who publish a leaflet illustrating the pattern and the stages in its construction.[2]

LEARNING TO LIP-READ

At the Ealing hostel, the children have definite lessons in lip-reading twice a day. They are taught one at a time by Miss Wendy Galbraith, the headmistress; but the other children and their mothers stay in the room, so that the mothers can be watching and learning all the time. When the school was visited there were five children in it, three of them aged 2 or under. These three had been deaf from birth or were deafened by illness soon after. The other two, aged 9 and 7, had also been deafened by illness—the elder as the result of treatment for tuberculous meningitis at the age of 8.

This girl has retained her speech, and she picked up lip-reading while she was in hospital, simply by watching the nurses. She is intelligent, restless, domineering, and anxious—a child with many adjustments to make, but affectionate and longing to succeed, though not very persevering. Fortunately her mother, also intelligent and affectionate, is very persevering. The problem of the teacher, as far as this child was concerned, was to get her to catch up on the school work which her illness has interrupted. She has plenty of ability, but still tires easily and loses interest.

A deaf child who has lost interest has a perfect defence against the importunate: he simply removes his eyes from the speaker's face.

Lessons for deaf children who have not yet learnt to lip-read or speak have to be planned in a broad way, to get them to attend to the signals coming to them from the speaking world. Unless a child is completely deaf—which is rare—some of these signals will be in the form of sound, but because his range of hearing is limited he will need to attend closely and have a great deal of practice before he can interpret them successfully. He must therefore supplement his defective hearing by attending to signals of other kinds; and on these he can begin to build a system of communications.

2. Hearing Aid Harness for Young Children. The Deaf Children's Society, 1, Macklin Street, London, W.C.2.

The teacher's first task is to get him to watch her mouth. Toys and pictures are used to gain his attention, and as soon as he is interested she brings the toy close to her own mouth, but to one side of it, so that her lips are plain to see. As the child's eyes follow the toy she speaks a simple direction to him, like: "Put the duck on the car." At first she has to show him what is wanted, and say his name: "Peter do it"; but he soon begins to connect her lip movements with the instructions—and this is a first step in lip-reading. The instructions are then varied, but the phrases used are simple, the teacher building always on what he knows already. Soon he starts making lip movements on his own account: "Bye-bye" is easily seen, and his first responsive "B-b-b-" is welcomed warmly by his world: he has got the principle of another means of communication; and so the work goes on.

THE MOTHER'S RESPONSIBILITY

It is hard work, making great demands on the teacher. During the short period the mother spends in the school she begins to see how every moment in the child's day gives her chances of coaching him, though it is exacting and tiring to remember to use these chances. She comes to understand that the child, cut off from so many signals, relies implicitly on those he gets from his mother. She has to learn to school herself, as well—to give up pointing with her finger, for instance (which draws the child's attention from her face) and to nod with her head towards the object she wants to indicate, while at the same time giving the spoken direction: at first he will obey the nod; later, when he has learnt to interpret the smaller signal, she will be able to give the spoken direction alone.

Any deaf child reaching school after such early training is at a considerable advantage. He has learnt much which the other deaf children have still to be taught, and he has learnt it at the time when his mind bends itself most easily to the task. He may even be fit to take his place in an ordinary school, anyhow after a time, and anything which brings the deaf person into the stream of ordinary life is highly valuable to him.

This is a pioneer school, doing important work. We hope it is the first of many.

Occasional Survey

FŒTAL CORTEX OF THE ADRENAL GLANDS

THE adrenal glands were described in 1563 by Eustachius, but very little additional information was gained until the middle of the 19th century when Addison described their destruction or atrophy in the disease which bears his name. In the following years Balfour,[1] Henle,[2] Kohn,[3] and others established the dual origin of the adrenal gland, the cortex originating from the cœlomic mesothelium and being homologous with the inter-renal organ of lower fishes, while the medulla has its origin in ectodermal cells of the neural crest which migrate to join the mesodermal component.

Chemical research lagged behind Addison's discovery, and it was not until 1895 that Oliver and Schäfer[4] isolated a pressor substance from the adrenal medulla; effective cortical extracts were prepared between 1927 and 1929 by Rogoff and Stewart,[5] Hartman and his associates,[6] and Pfiffner and Swingle.[7] In the following years this line of research led, by the work of Kendall, Reichstein, Pfiffner, and their associates, to spectacular discoveries which culminated in the isolation of a number of cortical hormones in crystalline form and the characterisation of their action and the relation of their chemical structure to their biological effects.

Meanwhile another stimulus for research came from reports on neoplasms of the adrenal in cases of precocious growth, masculinisation, and pseudohermaphroditism. Occasional observations on this syndrome, now generally known as the adrenogenital syndrome, date back as far as 1803, but interest in the fœtal and neonatal adrenal gland was awakened only after the report of Linser[8] and particularly after that of Bulloch and Sequeira.[9] A few years later Thomas,[10] Kern,[11] and Elliott and Armour[12] almost simultaneously discovered the peculiar involution which takes place in the neonatal adrenal gland. Finally, Selye's description of the "general adaptation syndrome" and of the changes in the adrenal glands in various stages of shock stimulated renewed study of them in neonatal life, in the hope of explaining the low resistance to all kinds of injury. An exhaustive study of adrenal glands in the first two years of life was published by Tähkä[13] in 1951; Lanman[14] has reviewed the work on the fœtal or transient zone of the adrenal gland, and Emery and his associates[15] have described extensive studies on the histology and histochemistry of infantile adrenals in various pathological conditions.

Three features make the human adrenal gland unique in the animal kingdom, except possibly for anthropoids. The first is the postnatal increase in medullary tissue together with a differentiation of sympathicogonia into nerve-cells and chromaffin cells. This takes place simultaneously with the regression of extra-adrenal chromaffin tissue, particularly of the organs of Zuckerkandl, so that the adrenals become the main factory of pressor amines.[16] The second is the intussusception of the cortex into the medulla so that the former not only surrounds the latter, as it does in most laboratory animals, but also forms an inner layer, the so-called central cortex; and thus the cortex and medulla are most intimately related. This phylogenetic feature of continual increase in the anatomical approximation of the two components of the adrenal gland—the inter-renal and the suprarenal organs, as they were named by Balfour[1]—from complete separation in sharks to closest approximation in man, is likely to have some physiological significance. Lucadou[17] published histological work which suggested that cortex and medulla form a functional entity, cortical hormones being secreted through gland-like lumina into the medulla; and Labhart and Spengler[18] have lately reported that adrenaline lowers the blood-level of cortisone and appears to increase the consumption of cortisone in the target organs. It has been suggested that the adrenal cortex manufactures a co-enzyme for dopa-decarboxylase and is thus essential for the synthesis of the pressor amines of the medulla,[19] and that cortical hormones induce the methylation of noradrenaline to adrenaline; but these hypotheses have not been proved and we are still far from understanding the cortico-medullary relationship in the adrenal gland.

The third feature of the human adrenal gland is the postnatal involution of the cortex which is associated

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with a decrease in size and weight in the first two to three months of life. Tähkä,[13] who investigated 311 adrenals of children from birth to two years of age, found that at birth the mean weight of both adrenals together was 6·5 g. This decreased to 3·51 g. at the age of two to three months, and this decrease was followed by a slow increase to a weight of 5·23 g. at the age of two years. The neonatal weight of adrenals is regained at the age of about twelve years. In premature infants the absolute weight is less and the postnatal decrease more rapid, reaching a minimum at the age of one to two months. There is no difference between the two sexes.

This postnatal decrease in size[20] and weight of adrenals is entirely due to a spectacular degenerative process in the cortex. In the cortex of the newborn infant two zones can be easily distinguished in a section stained with hæmatoxylin and eosin. The inner zone is large; it makes up about 80% of the total volume of the gland and consists of large cells arranged in sheets or in a pattern similar to that of the adult zona reticularis. The cells are packed with coarse eosinophilic granules; and the whole zone, which represents the transient or fœtal cortex, sharply contrasts by its pink colour with the outer zone which is darker and violet-coloured as the nuclei of its cells are more closely arranged and their almost colourless cytoplasmic rim is comparatively narrow. This outer zone is the permanent or adult cortex. It consists only of a zona glomerulosa, which forms arcades under the capsule, and often (particularly in full-term newborn infants) of short parallel trabeculæ of zona fasciculata. Sudanophil and bi-refringent material is very scanty in the neonatal adrenal. It is localised in the adult cortex at the inner border of the zona glomerulosa and inconstantly in the innermost part of the transient cortex.

Degeneration of the fœtal cortex starts immediately after birth in both full-term and premature infants, which shows that the process is initiated by the change from intra-uterine to extra-uterine life and is not determined by developmental age. However, it appears that birth itself induces the first changes. This is indicated by the common finding in stillborn infants of two zones in the fœtal cortex: an outer fairly compact zone, and an inner zone where the cells are disarranged by dilated and engorged capillaries. Kern[11] first described the histological details of the involution of fœtal cortex. He distinguished four stages of the postnatal development of the adrenal cortex:

(1) The first stage, lasting for three to four weeks, is characterised by extreme hyperæmia of the fœtal cortex, particularly its inner zone. This leads to compression of cell cords, their sidewards dislocation, and loosening of the whole structure.

(2) The second stage begins at the end of the first month and is characterised by progressive degeneration and finally disintegration of the cells of the fœtal cortex, together with further dilatation and engorgement of capillaries. The cells show vacuoles, droplets of sudanophil, in part bi-refringent, material, and pigment granules, and finally become transformed into a granular or striated mass which is arranged parallel to the distended capillaries. The endothelial cells of the latter are swollen; they contain fat droplets and hæmosiderotic pigment and apparently resorb material from the degenerating cortex.

(3) The third period begins towards the end of the first year and is characterised by the formation of a "medullary capsule." The hyperæmia decreases, the cells disappear, and at the same time the reticulum becomes thicker and more abundant, and the fibres now have the staining properties of collagen. With completion of this process a broad ring is seen which stains red with van Gieson stain, surrounding the medulla and separating this from the now well-developed permanent cortex.

(4) At the beginning of the second year of life the medullary capsule decreases in width by shrinkage and as the medulla grows the capsule disappears, its fibres being incorporated into the framework of the medulla. This process is usually completed by the age of puberty, but it shows great individual variation and remainders of the capsule may be seen even in the adrenals of old people. Growth and differentiation of the permanent cortex goes parallel with degeneration of the fœtal cortex, and continues afterwards. The narrow shell of adult cortex as seen in the stillborn infant, which consists almost entirely of a zona glomerulosa, acts as a "neogenic zone" for the growth of the permanent cortex. The zona fasciculata first becomes conspicuous and finally forms the main part of the adult cortex; the zona reticularis appears later. Emery et al.[15] found that the permanent cortex increases in width slowly in the first four days of life, but rapidly afterwards. They suggested that the growth of adult cortex in the newborn infant may be held in check by maternal corticoids and become conspicuous only after the latter have disappeared from the infant's circulation.

In the human adrenal the fœtal cortex is never incorporated into the permanent one; it always disappears and is replaced by permanent cortex. Although both fœtal and adult adrenal cortex originate from the same site in the cœlomic mesothelium there is a distinct time-interval between their formation. The primordium of the fœtal cortex can first be seen in six-week embryos as a proliferation of cœlomic mesothelium lateral to the base of the dorsal mesentery at the level of the cephalic pole of the mesonephros. The rapidly proliferating cells invade the underlying mesenchyma and within a week form a conspicuous cell mass, the primordium of the provisional cortex. At this time they become enveloped by a different type of cell which can be traced to the same focus of proliferation and which forms the primordium of the permanent cortex. In no laboratory animal is a zone found which could be considered identical with the human fœtal cortex. In the adrenal of the mouse there is a transient cortex which has been regarded as homologous to the human fœtal cortex. This zone is situated at the corticomedullary boundary and has been named by Howard[21] the X-zone. In contra-distinction to the human fœtal cortex, however, it shows sex differences, becomes evident only a fortnight after birth, and disappears in the male at forty days—i.e., at the time of sexual maturity. In the virgin female mouse this zone persists for eighty to two hundred days, but pregnancy causes it to disappear within twelve days. Clearly no conclusions on the function of human fœtal cortex can be drawn from experiments on mice. The same applies to the rat, in which Howard described a "juvenile cortex." This is a poorly demarcated zone at the corticomedullary boundary which disappears by transition into an adult zona reticularis, and not by degeneration as does the human fœtal cortex.

Persistence or delayed involution of fœtal cortex has been described in various conditions. Gillman and Gillman[22] reported it in kwashiorkor, together with pancreatic fibrosis. A similar finding was reported in congenital syphilis by Lewis and Pappenheimer,[23] who suggested that normal growth and differentiation of the pancreas is in some way associated with the involution of fœtal adrenal cortex. However, neither Lanman[14] nor I have found in cases of fibrocystic dystrophy of the pancreas any abnormality in the involution of fœtal adrenal cortex; and McNeill[24] found involution proceeding normally in 5 infants with congenital syphilis. Goldzieher[25] reported delayed involution in cyanotic congenital heart-disease, but normal involution was found by Tähkä[13] in 15, and by Lanman[14] in 17, cases of congenital heart-disease. The large adrenals reported in congenital pyloric stenosis appear to be due to the fact that congenital hyperplasia of adrenals with pseudo-hermaphroditism is in early infancy associated with a deficiency of mineralocorticoids and a clinical syndrome

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simulating pyloric stenosis, without anatomical changes in the pylorus.[12 26]

There are only two histological changes in relation to the fœtal cortex that are constant enough to throw some light on the function and biological significance of the transient cortex.

The first is the adrenal hypoplasia in anencephaly. In the 17th century Morgagni noted that the adrenals are unusually small in anencephalic monsters. The histology of such hypoplastic adrenals was elucidated by Elliott and Armour,[12] who found complete absence of fœtal cortex. Although there is a variation in the degree of hypoplasia and even more in the reduction or absence of fœtal cortex the report of Tähkä,[13] who, in one case of anencephaly, found adrenals of normal weight with a normal fœtal cortex, is unique. My constant finding, in a large series of anencephalic stillbirths, was extreme hypoplasia of adrenals. Weights as low as 0·2 g. were not uncommon, and even one of 0·1 g. was encountered. In hemi-anencephaly the hypoplasia is also present, but less severe. In anencephaly the fœtal cortex may be absent or considerably reduced in size. Meyer [27] found a normal cortex in 2 anencephalic fœtuses at two and five months. This suggests that it is only the later development of the adrenals which is disturbed in anencephaly. The constant hypoplasia of adrenals in anencephaly suggests some relationship between the involution of fœtal cortex and growth and differentiation of permanent cortex on the one hand, and either the pituitary or the central nervous system on the other. A pituitary gland can be often—possibly always—found in anencephaly when serial sections are examined from the area of the poorly developed sella turcica,[28 29] but it is usually small and of abnormal shape. The neurohypophysis is either absent or rudimentary. While the defect in the development of the posterior lobe is part of the anencephalic malformation, the abnormality of the anterior lobe is the mechanical effect of the deformity of the sella turcica and varies with the shape of the sella. Though it appears reasonable to assume that adrenal hypoplasia is the result of pituitary malformation, how the pituitary governs the involution of fœtal cortex is unknown. At the same time as the fœtal cortex degenerates there is a marked growth of permanent cortex, and Lanman [14] reports that in a hundred-day-old infant, who had received corticotrophin (A.C.T.H.) in two periods—at thirteen to fifty-two and at seventy-two to a hundred days—in doses of 20 or 30 mg. per day, the involution of the fœtal cortex was normal. It is, therefore, not the deficiency in corticotrophin which accelerates the degeneration of fœtal cortex in the anencephalic monster. Angevine [29] found no correlation between size of pituitary and size of adrenals in anencephalics. It would also be difficult to ascribe the adrenal hypoplasia in anencephaly to pituitary hypoplasia when we realise that the fœtus is supplied with maternal hormones and that the maternal pituitary is markedly enlarged in pregnancy, unless the pituitary hormone has too large a molecule to pass through the placenta. The histological changes in the postnatal development of the pituitary bear no relationship to the involution of fœtal adrenal cortex. In the pituitary of the newborn chromophobe cells are predominant, and chromophil cells, especially eosinophil, are scanty. The latter increase slowly and continuously from birth until puberty. The whole problem is far from being elucidated, and in further research the possibility that the central nervous system governs the growth and involution of fœtal cortex will have to be considered.

The second observation which appeared likely to elucidate the significance of the fœtal cortex and its involution was made by Broster and Vines.[30] These workers claimed that Vines's Ponceau-fuchsin stain is specific for androgens. They found fuchsinophil granules in the fœtal cortex of the male in the ninth to twentieth weeks of gestation, and in the female in the eleventh to fifteenth weeks. Fuchsinophil granules are found in congenital hyperplasia of the adrenals and in tumours associated with the adrenogenital syndrome. Broster and Vines [30] suggested that female pseudohermaphroditism is due to prolongation of the masculinising phase of intrauterine life. Allibone, Baar, and Cant [26] found in neonates with pseudohermaphroditism great variation in the amounts of fœtal and adult cortex. In the adrenogenital syndrome of older children they found the cortex to be mainly, but not entirely, of fœtal type with a positive reaction to Vines's stain, but this reaction was also shown by cells of the adult cortex.

In addition, one has to bear in mind that a hyperplastic reticularis may be histologically indistinguishable from the transient cortex, and there is some evidence that the hyperplastic zone in the adrenogenital syndrome is the adult zona reticularis and not the fœtal cortex.[14] Gersh and Grollman [31] and Carnes [32] failed to demonstrate androgenic activity in extracts from human fœtal and neonatal cortex. The problem is further complicated by the fact that the amount of cortical hormones secreted is enormous in comparison with that which can be extracted from the gland.[33] The amount of hormones which the adrenals discharge into the circulation within one minute is ten times that present in the organs, and on stimulation by corticotrophin it may increase to fifty times.[34] Absence of hormones in extracts or absence of lipids in histological sections may be due to faulty formation or to over-rapidity of discharge. Only coördination of biochemical investigations in vivo with histochemical examination can contribute to the problem of androgenic activity of fœtal cortex. Day [35] found a transient increase in the urinary excretion of 17-ketosteroids in the neonatal period, but it was suggested by Jailer and Knowlton [36] that the placenta is a source of ketosteroids.

There is no evidence that the fœtal cortex regulates electrolyte metabolism, and it seems that the permanent cortex of the newborn is defective in this function. Thus Klein [37] found that in the newborn urinary sodium excretion was increased one day after an adequate dose of corticotrophin, and Emery et al.[15] found no response to stress in the adult cortex of infants less than two days old.

There is no proof of the hypothesis that the fœtal cortex protects the organism against maternal œstrogens. It is unlikely that the fœtal cortex is concerned in the low oxygen tension in fœtal blood or the resistance of young animals to anoxia, for this resistance is found in animals which have no fœtal cortex.

Thus, despite a considerable amount of work, the function of the fœtal cortex remains unknown. From the teleological point of view, it would appear reasonable that the fœtus, which receives from the mother a balanced electrolyte solution with glucose, has no need of its own corticosteroids to regulate mineral and carbohydrate metabolism. But it needs its own factory of hormones for the regulation of its sexual differentiation and growth. However we have seen that there is still no definite proof that such hormones are manufactured in the fœtal cortex. Further information may be expected from histochemical examination of fresh adrenals of human fœtuses and neonates. Unfortunately such material is only rarely available, and we have as yet no reliable methods for demonstrating ketosteroids in histological sections. Bennett's phenylhydrazine reaction and the naphthoic-acid hydrazine-dianiside reaction have been mainly used, and the identification of ketosteroids by a "battery of reactions" has been recommended. Pearse [38] and Gomori [39] both agree with the conclusion of Boscott and Mandl [40] that an artificial mixture of neutral fats, cholesterol, carotinoids, tissue-aldehydes, and phospholipids would give positive results in all the tests even in the absence of ketosteroids.

H. S. BAAR.

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Parliament

QUESTION TIME

Treatment of Sexual Offenders

Replying to a question, Sir DAVID MAXWELL FYFE, Home Secretary, said that prisoners convicted of offences of a sexual nature were specially investigated by prison medical officers, who were instructed to recommend for psychiatric treatment those likely to prove susceptible to it. A prisoner would not benefit by such treatment unless he had a sincere desire for it and a genuine anxiety about his condition. Such adverse factors as low intelligence, advancing years, and a history of persistence in the commission of offences reduced the number of suitable cases. So far as England and Wales were concerned, there were three centres—Wakefield, Wormwood Scrubs, and Holloway—to which selected prisoners were sent to receive special treatment from visiting psychotherapists. The precise nature, extent, and duration of treatment in a particular case were determined by the doctor carrying out the treatment. The forms of treatment used included both individual and group methods, assisted, as occasion required, by special procedures. There was also treatment of a less formal kind, especially in training establishments, in which the medical officer played a valuable part as a member of a team. The number of prisoners convicted of offences of a sexual nature, who were under regular treatment by a visiting psychotherapist for a period exceeding six months in the years 1951, 1952, and 1953, was 25, 26, and 27, respectively. He would hesitate to speak of cure in homosexual cases, and any attempt to give figures of supposed cures could only be misleading.

Mr. LESLIE HALE asked the Minister of Health whether he was aware that congenital sexual inversion yielded more readily to treatment during the period immediately following puberty; and whether he would consult the authorities, with a view to advice and treatment being made available, where parents of suspected inverts sought such help.—Mr. IAIN MACLEOD replied: I am advised that in cases where treatment is likely to be beneficial, the earlier it is begun the better. Advice is available at hospital psychiatric clinics, of which there are over 400 in England and Wales.

M.R.C. Report on Flour-improvers

Dr. BARNETT STROSS asked the Minister of Food whether he was now able to make a statement on the change-over from agene to some other substance as a flour-improver; and what were the substances that had been investigated.—Major GWILYM LLOYD GEORGE replied: I understand that the Medical Research Council have now reported on the tests carried out on certain flour-improvers. Their report will be considered by the appropriate subcommittee of the Inter-departmental Standing Committee on Medical and Nutritional Problems, and I must await their recommendations. The following methods of improvement have been investigated: agene, chlorine dioxide, the aeration process, ascorbic acid, and potassium bromate.

Cancer Registration

Replying to a question, Mr. MACLEOD, Minister of Health, said that effective registrations of new cases of cancer in hospitals in England and Wales, which were 23,239 in 1945, 40,333 in 1947, and 49,110 in 1948, were expected to be about 58,000 for 1953. This last figure was estimated to be about half the total probable number of new cases of cancer in 1953 in England and Wales. He had recently issued a circular encouraging hospitals to make still greater efforts to achieve the registration of all cases, and he had asked for progress reports by June 30. Registration was still being done on a voluntary basis. He had recently been advised by his standing Advisory Committee that it was best that it should continue on a voluntary basis.

Increase in Incidence of Blindness

Replying to a question, Miss PATRICIA HORNSBY-SMITH, parliamentary secretary to the Ministry, said that at Dec. 31, 1952, there were 88,596 blind persons registered with local authorities; the average annual increase during the last five years in the numbers registered was 2388; the age-group in which the increase was most marked is the "70 years and over" group; the increase was attributable to the general trend towards longevity and the blinding affections of old age.

Modern Equipment for Hospitals

Mr. ARTHUR BLENKINSOP asked the Minister whether he would make a special capital allocation to regional hospital boards to meet major expenditure upon the modernisation of heating, sanitation, and laundry arrangements in order to secure economies in running expenses.—Mr. MACLEOD replied: Revenue-saving projects are already among those to which Regional Boards have been asked to give priority. I am, however, already reviewing the possibility of some special allocation in the future.

Cost of N.H.S. Prescriptions

Replying to Mr. SOMERVILLE HASTINGS, who asked what was the total cost of prescriptions made up under the National Health Service by retail pharmacists in each of the years 1949 to 1953; and what was the average cost of each prescription, Miss HORNSBY-SMITH gave the following figures:

*Prescriptions Dispensed by Chemist-contractors * in England and Wales*

Year	*Total cost*	*Average cost per prescription*
	£	*pence*
1949	30,331,303	36·04
1950	34,804,535	38·47
1951	41,662,354	43·91
1952	43,768,599	48·63
1953 (first six months)	23,898,821	49·15

* Includes retail pharmacists and contractors supplying appliances only.

Assistance Grants for N.H.S. Charges

Replying to a question, Mr. R. H. TURTON, parliamentary secretary to the Ministry of Pensions and National Insurance, said that the total amount contributed by the National Assistance Board for National Health Service charges from May, 1951, to December, 1953, was about £1,775,000.

Quinquennial Review of National Insurance

Replying to Dr. EDITH SUMMERSKILL, Mr. OSBERT PEAKE, Minister of Pensions and National Insurance, said that as soon as possible after the close of the current financial year the Government Actuary, as required by section 39 of the National Insurance Act, would prepare his report on the finances of the scheme for the period July 1948 to March 1954. This report would be presented to Parliament in due course and be followed by a report by the Minister on rates of benefit under section 40 of the Act. It was hoped that a report might be received at about the same time from the Phillips Committee, which was examining the economic and financial problems involved in providing for old age.

The quinquennial review was the first to be made since the scheme started, and it had alway been understood that the opportunity would be taken at the same time to review the provisions of the scheme as a whole. Considerable progress was being made. He had already been in consultation with the National Insurance Advisory Committee and with local advisory committees.

Psychiatric Examination of Accused Persons

Mr. SAMUEL STOREY asked the Home Secretary whether, in view of the evidence given at a recent murder trial that his department had given permission to a psychiatrist engaged by the defence to examine the accused while under the influence of an anæsthetic, he would give an assurance that no such test would be permitted upon any person suspected of, or charged with committing, a crime.—Sir DAVID MAXWELL FYFE replied: When a defendant in a criminal case is in custody, it is the practice to afford the defence facilities to carry out, of course with the consent of the accused, such examinations as they consider appropriate, provided that they are not likely to have an adverse effect on the defendant's health or to impair his fitness to stand his trial. I see no reason to change this practice.

Welfare of the Handicapped

Replying to a question, Mr. MACLEOD said that 81 local authorities in England and Wales had submitted welfare schemes for the physically handicapped, and all the schemes included provision for training in handicrafts.

In England Now

A Running Commentary by Peripatetic Correspondents

WE were tired of our winter cough, so on a night in mid-February, when the snow was beginning to melt and the pipes were beginning to burst, we set out in a flying-boat, not much bigger than a London bus, and the next morning swooped down into Funchal bay, Madeira. Sunshine, blue sea, blue sky with a few white clouds, green mountains, white buildings, and cascades of brilliant flowers greeted us. Our room was full of roses and freesias. We shed our gloves and our winter clothes and prepared to bask.

At the English country club a tennis tournament was in progress; we took tea on the lawn; green canaries sang in the branches, vying with the familiar chaffinch; the dragon tree and the elephant tree and the sausage tree seemed more fantastic than ever. The stones by the swimming-pool were almost too hot to sit on.

This idyll lasted a few days; then snow appeared on the tops of the mountains, the clouds became grey and covered the sun, giving only a glint here and there; the balmy breezes became waspish.

One grey morning we boarded a bus; it took us along the coast to the West through banana groves, sugar-cane plantations, and vineyards. It stopped at villages and at lonely points. One woman, met by her family to carry the lesser packages, lifted a high basket, covered with a white cloth, on to her head, grasped a bag of wriggling black piglets in her left hand and stepped with magnificent poise down a narrow path between red earth fields. We passed through a grove of mahogany trees, but the valleys were mainly terraced in small fields, intensely cultivated and watered by the rushing aqueducts. Peach in blossom, orange in fruit, loquot, green and yellow made strange contrasts. The stream beds were studded with arum lilies. At one village, famed for its butter, a grave sallow woman and two sparkling girls in yellow shawls and red petticoats came into a thatched shed with open front. We supposed the shed was for the collection of butter and milk, baskets of fruit, vegetables, and so on, to await transport, but not at all; it was purely a gazebo from which to see the world go by.

The bus and driver remained for two hours at Boaventura with the lovely name and a blue and white tiled church on the hill. We walked down the road and lunched on a high cliff watching the long Atlantic rollers creep in from the North. They did not break as the waves do on our white cliffs, but dissolved in thick slow foam, covering the rocks on the shore and surging up the black cliff face. The wind did not buffet us, it reached and searched, threatening to tweak over the edge the tin cups from which we drank our pahlie-ahlie (spelt pale ale). It was very cold.

A day or two after this we began to shiver, we felt hot and cold, our cough was worse, we could neither eat, smoke, nor sleep. We had a pain in our ribs and the effort to walk to this garden or that was herculean. We began to think we were ill; we thought we had pleurisy (we had). We gave a farewell party; of the delectable Madeira wines, Sercial, Verdelho, Boal, only the dark rich Malmsey with its fatal associations suited our mood. We rose next morning at 5 and at last reached Southampton Water on a cold dark evening. Again the snow was beginning to melt and the pipes beginning to burst . . .

* * *

I qualified in medicine at an English medical school and developed the belief, proper in the circumstances, that English medicine was the best in the world and as near perfect as possible.

America was sometimes mentioned during our training, usually in connection with some bizarre procedure. It was the place where some man turned all his presentations into breeches before delivery, and so on. Often statements about practices contrary to our own were accompanied with verbal shoulder shrugs. "There is a man in America who claims . . . and does . . . but we . . ."

Since graduating, most of my time, now approaching two decades, has been spent on the Western littoral of the North Atlantic. From my sparsely populated subarctic abode I lately had occasion to go and haunt one of New York's larger hospitals for six weeks. There were the same shrugging shoulders and raised eyebrows. "There is a man in England who claims . . . and does . . . but we . . ."

* * *

It is all very well for your Flying Saucer correspondent to advocate escapism into his little world of leprechauns and fairies, but it is most infuriating for the observer of the unusual to meet universal scepticism. Not long ago I was driving the children home from school across the moor when I caught sight of an enormous bird of prey perching on a roadside tree. I slammed on the brakes and almost dragged the family out of the car. "Look, look!" I cried "There's a Golden Eagle just flying away!" We saw its great wing span and outspaced pinions, its feathered legs, and its curved beak as it swept away over the hills. We drove home thrilled with the sight.

The village received our news with polite reserve. Perhaps it was a buzzard said someone charitably. I protested that I see buzzards almost every day, as some nest not far away, and that anyway our bird was far far bigger than any buzzard; but our village is a haunt of anglers and immune to sportsmen's tales. I was accused of seeing herons, hawks, and ravens, and the story was so often greeted with mocking pity that I soon ceased to tell the tale. Leprechauns they could have understood, but Golden Eagles never.

As the weeks went by there were two or three reports in the press of an eagle having been seen in the district, but the editors cautiously played them down. I sneaked off to the zoo to have a look at the aviary and came back quite convinced in my heart. Now I read that the Home Counties have been visited by a Golden Eagle whose identity has been confirmed by the Experts. I am beginning to feel better about the whole affair, but if I hook a coelacanth on my rod this summer I propose to keep quiet about it. Excuse me a moment, I think a Flying Saucer is about to land.

* * *

The fit-looking man waiting in my consulting-room said he didn't know why his doctor had sent him to me for he had an iron constitution. On investigation he proved to be quite right, for he had hæmochromatosis.

* * *

I really gave up smoking because of the cash. But lately I have begun to count the clinical cost. True I may avoid cancer of the lung and Buerger's disease; carcinoma of the tongue may pass me by, and so may apithelioma of the lip, duodenal ulcer, and even tobacco amblyopia. But what lies on the other side of the scale?

First, of course, my steady 11st. 9 lb. has leapt to 13st. in a month, with appetite unhampered by the usual pre-, intra-, and post-prandial cigarette. A bar of chocolate or some barley-sugar takes the place of several of the forsworn tubes each day. Already I can't tie my shoe-laces or rake out the boiler without puffing like a grampus and feeling my eyes bulging. I can't skip up the hospital stairs four at a time, at least a flight ahead of my houseman.

And the future is even grimmer: flat-feet in a year or two, and osteo-arthritis of knees and hips, varicose veins, lordosis, and a postural backache in no time at all, with the certain knowledge that it will be called a disc by the first orthopod or physical-medicine expert who sees it, thus making me a convinced psychopath at a stroke. Gall-bladder disease will appear if I live long enough, worn-out islets of Langerhans, rapidly advancing dental caries, and, of course, polyarticular arthritis. And boils. But probably the outlook is less rosy even than that. Fatty infiltration of every solid viscus and a far earlier coronary than I would otherwise have had make the prognosis months rather than years—days, almost.

"Lend me a cigarette, Jim."

* * *

No inertia?

My pregnant Italian patient, sent by the midwife to be examined for gas-and-air analgesia, asked for her "gasoline certificate."

Letters to the Editor

RESPONSIBILITY IN HOSPITAL

SIR,—Your leader last week draws attention again to the problem of responsibility in hospital.

Many of us in Scotland are apprehensive lest the Scottish position of sole professional responsibility may not be maintained. We believe not only that the doctor should accept complete responsibility for all his clinical actions, while making adequate insurance provision for legal costs and damages, but also that if hospital authorities become (or in England remain) vicariously responsible at law for the *clinical* actions of their staffs—on the principle that they are the "employers"—the step is but a short one to the loss of professional freedom.

An increased volume of litigation, and perhaps increased generosity of juries, must tend to make hospital authorities administering public funds more careful, or at least wishful to avoid claims for negligence. How can they avoid such claims, apart from taking reasonable care to appoint properly qualified persons, except by trying to ensure that risks are not taken? If a surgeon is faced with a decision whether or not to undertake a procedure with a 50% or less chance of success he weighs the risks to life and function with and without his treatment and takes his decision on clinical grounds alone. But if—and it does not seem to me fanciful to imagine this situation—a management board were to feel obliged to adjudicate in such a case, the board would decide not to take the risk of subsequent legal action in the event of failure and would forbid the operation. Similarly there appears to be no little risk of authorities forbidding the use of certain drugs or techniques of unproved efficacy or of proved danger. Brilliant medical and surgical successes and technical advances are not made in such a stifling atmosphere of administrative caution, prohibition, and direction, but only where initiative is allowed to flourish freely—in an atmosphere of restless inquiry, calculated risk, and bold decision leavened by technical skill and deep experience. Such an atmosphere in fullest degree can exist only when the doctor is prepared, and happy, to accept all the responsibility for his clinical actions and be answerable for these actions to no board or ministry but only to his patient. Not only would the doctor gain stature and freedom but the public must benefit if the danger of clinical direction of the doctor by his hospital authority is avoided. It has never been suggested that the aggrieved patient in Scotland has been denied justice by being unable to sue the hospital authority.

Many in Scotland, still enjoying the freedom of sole professional responsibility, are amazed at the seemingly complacent acceptance by their English colleagues of a situation which seems so fraught with danger. The short-term financial attractions of the position, the knowledge that costs and damages will be shared by the hospital authority, must surely not be allowed to blind us to these dangers of clinical direction and loss of professional freedom inherent in the English "system."

It is easy to understand that the defence societies must favour the English "system," with its sharing of costs and damages between the hospital authorities and unsuccessful defenders. The societies must naturally be more immediately concerned with ensuring the maintenance of their financial position than with matters of deep professional principle in relation to freedom of practice. However, even at the cost of an increased premium for medical defence insurance, doctors should do all they can to attract to their shoulders the full weight of clinical responsibility and ensure their professional independence. There could surely be no objection were it made a condition of appointment to a hospital post, in whatever grade, that the doctor should be a member of a defence society. After all we all accept the rightness of compulsory third-party insurance for car-drivers.

I would ask again, Sir, your own final dramatic question: "How can the medical practitioner tolerate the view that he is the employee or the servant of anybody but his patient?"—and answer, "He cannot."

Edinburgh. J. G. M. HAMILTON.

ABUSE OF ANTIBIOTICS

SIR,—Once upon a time there was only one antibiotic—and that in short supply. It was reserved for selected cases and administered with such awe and circumspection that we gradually became expert in assessing its value and its limitations.

Soon, however, research and synthesis in this new field devised fresh products with such rapidity that the harried practitioner could no longer keep pace with them. Nowadays, moreover, each basic drug is known by anything up to a dozen trade names, and new ones seem to be introduced with every morning's mail.

The effect of these developments has grown much more serious since oral antibiotics became fashionable. Potentially dangerous capsules are distributed as freely as aperient pills and with a much less specific end in view. The common cold or sore throat, the mild attack of enteritis or influenza is seldom allowed to subside until one antibiotic or another has been empirically prescribed. Skin reactions and other complications of long or short duration become more frequent and the whole value of these new and important drugs is being destroyed by the production of insensitive strains of bacteria.

Has not the time arrived for setting up a committee of physicians, surgeons, pathologists, and general practitioners who could investigate the whole range of antibiotics? When the problem has been clarified all of us would welcome a sober assessment of the drugs available and a stern criticism of the haphazard therapy at present in vogue.

Swansea. C. J. CELLAN-JONES.

TOO MANY ANÆSTHETICS?

SIR,—It is several weeks since a new anæsthetic agent was discovered or a revolutionary anæsthetic technique described; and the lull seems a good moment for one or two reflections on the vivid scene by an ignorant, though fascinated, bystander.

When I was a student only three general anæsthetics were in common use, and the dull but exemplary existence of an anæsthetist could be enlivened only by varying the proportion in which these agents were administered. At the time of going to press, the anæsthetist has a choice of no less than 43 poisonous drugs, which can be inhaled, swallowed, or injected. He is also empowered, if he so desires, to freeze the patient, or temporarily to confiscate his very life blood. Breathing used to be considered one of the more necessary attributes of health, but it is now replaced by haphazard squeezing of the anæsthetist's rubber bag. Some may doubt whether this is a change for the better.

It is small wonder then that the anæsthetist is often paid at a higher rate than the surgeons who work for him, and even physicians have suffered by the new order—for it is unreasonable to ask a physician to say whether a patient is fit for an operation he has never seen under an anæsthetic he has never heard of. All branches of the profession, however, can join in treatment of the new anæsthetic diseases such as gangrene of the hand, paralysis of the brachial plexus, hypoxia, and prolonged apnœa.

The patient still speaks of going into hospital for an operation, not for an anæsthetic, and most patients cling to the belief that the anæsthetist's job is to take the pain

out of surgery. The initiated know that he has a further task, to provide satisfactory operating conditions for the surgeon, but it seems that these two aims were achieved some time ago, and it is very difficult to understand the feverish search for new drugs to do the same things in a different way.

The poisonous permutations are now so numerous that young anæsthetists have little time to master one technique before fashion or curiosity drives them to another. Few brains can encompass and interpret the myriad impacts of these drugs upon the physiological processes of the body, and earnest discussion may centre round the dramatic side-effects of a poison which need never have been used at all.

General anæsthetics can be divided into two groups—those which are inhaled, and those which are injected. I have noticed that when wise and experienced anæsthetists are faced with a "bad risk" they tend to use more of the inhalation group and less of the injection group. There may be a moral in this which I am too stupid to see.

Anæsthesia has advanced so far and so fast that the spearhead is way ahead of the main body of anæsthetic knowledge and virtuosity. Is it not time to call a halt, or even to withdraw a little to positions which time has prepared? One sometimes feels that hibernation is a more appropriate state for the anæsthetist than for the patient.

Barnet. V. J. DOWNIE.

POLIOMYELITIS AND INOCULATIONS

SIR,—Professor Bradford Hill and Dr. Knowelden, in their letter of March 13, do not deal with the main point which I raised. The number of poliomyelitis cases found to have occurred within a month of inoculation in their investigation was that which would be expected simply by chance. The corresponding number for the control group was impossibly small. Such evidence is sufficient to establish that the controls are biased. Whenever controls are selected by what is essentially a purposive rather than a strictly random method this danger arises. As always when such methods are used, it is only possible to speculate on how the bias arose. It is useful to do so, however, in order that future investigations may not suffer in the same way, and I put forward some suggestions in my letter of March 6.

It is on these suggestions, rather than the main point, that Professor Bradford Hill and Dr. Knowelden have commented. They say that my objections to the measles controls have "no substance since there is no difference between the poliomyelitis group and the measles group in the frequency with which they had been immunised at dates *more* than one month previously." My argument was that if a child is notified as having measles today it is possible that circumstances connected with having measles may have affected its chance of being inoculated in *the past two or three weeks*. I would, however, hardly expect that having measles today would affect the chance of the child having been inoculated in the more distant past since by definition it could scarcely have had measles then.

It seems that I misinterpreted the description given in the original report [1] of how the controls were chosen. This read as follows: "We finally determined to ask the medical officer of health to take for each of his poliomyelitis cases a child of the same sex as that case and of closely similar age, but one who was notified at approximately the same date as the poliomyelitis case as suffering from measles. Failing this we asked him to take for each poliomyelitis case a child of the same sex who was born at the same time as the poliomyelitis case, the name to be drawn from the notification of births register." My interpretation of this, that a "birthday control" was taken whenever a "measles control" could not be found, was wrong. Only one type of control was used in any one area.

The view that the two sets of controls were therefore independent is not, however, strictly correct. The choice of controls for a particular area was not made at random but was determined by the presence or absence of measles cases. All this new evidence does is to suggest that the bias probably arose in some other way than that which I suggested.

London, W.C.1. P. G. GRAY.

1. Bradford Hill, A., Knowelden, J. *Brit. med. J.* 1950, ii, 1.

SELECTIVE PITUITARY FAILURE

SIR,—Your leading article (March 13) prompts me to comment upon this most interesting problem. As you point out, over-production of single anterior pituitary hormones may be regarded as an established fact. This occurs not only in acromegaly but also after castration, during the menopause, in Klinefelter's syndrome and ovarian agenesis in respect of gonadotrophins, and in certain states of abnormal thyroid activity and "pituitary" exophthalmos in respect of thyrotrophin. It is therefore logical to expect that selective pituitary failure also exists. I believe that Wilkins and Fleischmann [1] first described selective deficiency of gonadotrophin, in a 21-year-old girl with normal height and eunuchoid body proportions. The patient had abundant pubic hair, primary amenorrhœa, normal follicle-containing ovaries, and an abnormally low excretion of gonadotrophin, whereas her ketosteroid excretion was normal. The last-mentioned finding and the abundance of sexual hair suggest that her corticotrophin secretion was normal. It is important to note that the condition of sexual hair may be indicative of the level of corticotrophin secretion.

There are other clinical findings which suggest selective pituitary failure or overactivity and, possibly, even simultaneous deficiency and overproduction of different pituitary hormones. Thus, cases of eunuchoid gigantism and of so-called hypogonadism with eunuchoid body proportions may be due not only to primary deficiency of gonadotrophin or primary gonadal failure but also to an associated excessive production of growth hormone. This possibility is suggested by the fact that many patients with primary testicular failure (Klinefelter's syndrome) have normal heights and body proportions and that growth in ovarian agenesis is normal or deficient. Lack of gonadal activity alone can therefore not be the cause of excessive height or eunuchoid body proportions, as has so far been generally presumed.[2]

With regard to juvenile growth-hormone deficiency clinical observation points to the fact that various combinations of anterior pituitary deficiency may occur. The classical pituitary dwarf may or may not have an associated gonadotrophin and corticotrophin deficiency; gonadal function and the development of sexual hair may be quite normal, and pregnancy in such dwarfs has been observed.[3] It seems definite that certain cases of pituitary dwarfism form a link between the state of isolated growth-hormone deficiency and that of more or less complete infantile panhypopituitarism, as represented by the classical form of Lorain-Levi's pituitary infantilism or, more clearly, by the condition of progeria; and I have no doubt that a detailed clinical analysis of such cases will furnish evidence of various forms of selective anterior pituitary failure. I myself have described a 16-year-old patient with pituitary dwarfism who showed normal genital development but absence of body hair and lack of adipose tissue,[4] thus suggesting an

1. Wilkins, L., Fleischmann, W. *J. clin. Endocrin.* 1944, **4**, 306, 357.
2. Ucko, H. Endocrine Diagnosis. London, 1951; p. 448.
3. Hewer, T. F. *J. Endocrinol.* 1944, **3**, 397.
4. Ucko, H. Endocrine Diagnosis. London, 1951; p. 441.

associated deficiency in corticotrophin secretion and, possibly, hypothalamic-pituitary disturbances relative to the ability to deposit fat. There is reason to believe that the last-mentioned disturbance may also play a part in some cases of true Fröhlich's syndrome, in which there are very often signs of an associated growth-hormone, gonadotrophin, and corticotrophin deficiency.

London, W.1. H. UCKO.

GROWTH OF PREMATURE CHILDREN

SIR,—Your leader of March 20 summarily condemns all work on the growth of premature babies, other than that of Douglas and Mogford, as being uncontrolled and unreliable. Though agreeing that the work of Douglas and Mogford is excellent, I do feel that the criticism of the work of others is quite unjustified. In what way, for instance, to give three examples out of several possible ones, does it apply to the papers of Blegen [1] and Alm,[2] and to the Sheffield work [3]?

Department of Child Health, University of Sheffield. R. S. ILLINGWORTH Professor of Child Health.

ORDINARY YOUTHS

SIR,—It is always easy to introduce wrong emphases (and reveal emotional bias) by quoting statements out of context, as Dr. Henderson did in your issue of Feb. 13. We did not reply to his letter because we thought that this would be obvious to your readers. But in your issue of March 6 Dr. Henderson returns to the attack, misleading your readers on this occasion by an interpretation that we "implied" in our paper [4] "that there was evidence that uninhibited premarital sexual intercourse would be of benefit to the mental health of young people." It is untrue that we made such an implication. Worse still: since many of your readers will not see the original article it is particularly irresponsible to attribute these implications to us.

The passage to which Dr. Henderson refers comes towards the close of a long paragraph in which we deal with the young men's interest in their social and emotional relations with girls. We record their notion which was frequently put to us of marriage as "an equal partnership," "sharing interests and money," which "was often considered by the young men to differ from the relationship between their own parents." We further stated that "this attitude of mutual sharing was also expressed in their attitudes to sexual behaviour which most of them regarded as a co-operative enterprise, be it at the level of petting, pre-marital or marital intercourse." Their common confusion in these attitudes is described, but we conclude that "there does seem to be evidence, however, that these young men were reaching towards a freer and less guilt-ridden expression of heterosexual relationship, and this may become an important factor in mental health." Later we point out that these tentative findings raise many problems, and that further investigation is needed to confirm them and to explore their possible consequences on family life. We record that many of the youths revealed a need and search for help as regards their emotional relationships with girls, and state our own opinion that at this age the need for help is urgent. We found no evidence that the family doctor was consulted on these problems.

Two further points in reply to other correspondents. The young men were about as representative a sample of ordinary 18-year-olds as can be had, though of course a small one, all 85 youths registering for National Service in a single borough. Some information was obtained on each of the 85 and a considerable amount about 74 of them. Nowhere in the paper do we apply our findings based on this specific group to 18-year-olds in Great Britain generally. Finally, we do not consider that our findings are "sensational." We doubt whether they will come as a surprise to any doctor or social worker in close contact with today's urban youth or indeed to anyone who is prepared to listen and to explore with an open mind the way of life of another generation.

Student Health Service, University of Manchester. R. F. L. LOGAN.

Social Medicine Research Unit, Medical Research Council. E. M. GOLDBERG.

1. Blegen, S. D. *Acta pædiatr., Stockh.* 1953, suppl. 88.
2. Alm, I. *Ibid*, suppl. 94.
3. Illingworth, R. S., Harvey, C. C., Jowett, G. H. *Arch. Dis. Childh.* 1950, **25**, 380; Illingworth, R. S. *Brit. med. J.* 1950, i, 96; Illingworth, R. S., Harvey, C. C., Gin, S. Y. *Lancet*, 1949, ii, 598.
4. *Brit. J. Sociol.* Dec. 31, 1953, p. 323.

TENDON LESIONS IN RHEUMATOID ARTHRITIS

SIR,—Your annotation of March 13 was of special interest to me.

In my experience, it seems that these lesions are secondary, the primary cause being continued spasm of the associated muscles, leading to the formation of myalgic spots, which are often found near the origin of the affected muscles. These spots cause pain referred to the tendon, not local pain, and, eventually, restrict movements of the joints.

These lesions are common in rheumatoid arthritis because, I think, these myalgic spots are not recognised and treated in the early stages of the disease. Their efficient treatment would lessen deformities.

Because of the deficient circulation in the affected limb, and the aggravation of muscle spasm, a vicious circle is created, causing congestion and œdema, with the formation of metabolites. The eventual result is atrophic changes in the muscles, tendons, and surrounding soft tissues. The deficient circulation in this disease was demonstrated by Leb,[1] who, by injecting a radio-opaque fluid into the brachial artery, showed constriction of the arteries and arterioles.

In a series of more than 200 patients with rheumatoid arthritis (mainly between 60 and 80 years of age), most of them had these lesions. Myalgic spots were present mainly in the origins of the affected muscles in all except 14 cases in which there was considerable muscular wasting. All were in pain, with restricted movements of fingers, hands, or toes. Pressure over the affected tendons produced acute pain.

Deep massage with adrenaline cream in this age-group resulted in rather painful tissue reactions and so a new technique was adopted. This was the intracutaneous injection, in minimal doses, of adrenaline tartrate (1 in 100,000): 2 minims is sufficient for 4 or 5 injections.

Four or five minute blebs are made, the first one over the myalgic spot near the origin of the affected muscle, and the remainder along its course and over the affected tendon. Should these spots be difficult to find, a preliminary injection over the area will often relieve the superficial protective muscle spasm, making them more evident. In most cases, often within a few seconds, muscle spasm was greatly relieved, pain was eased, and movements at the affected joints were much freer. If there was deficient pronation or supination, it was found that injections made over the corresponding muscles increased these movements. Superficial massage was given after the injections for a minute or so, and the usual precautions taken to prevent too active movements for the first few days. The injections were repeated, if necessary, every four or five days, the patient in the meantime continuing with the massage.

Results have been most encouraging. It was not unusual to discharge some patients considerably improved after four or five weeks, with more flexibility of fingers and hands and able to do such things as pour out tea, open doors, and other things that they had not been able to do in comfort for a long time.

A questionnaire sent to these patients a year after their last visit showed that a high proportion were still comfortable and had not regressed.

London, W.1. LOUIS MOSS.

1. Leb, A. *Brit. J. Radiol.* 1952, **25**, 140; *Fortschr. Röntgenstr.* 1951, **75**, 251.

SHOE DESIGN AND THE GREAT TOE

SIR,—The natural position of the toes, with gaps between them, is seen in the foot of a Burmese woman, aged 28, who came up for routine examination at the Sheffield Student Health Centre (fig. 1). She never wore shoes of European type before setting out for this country three months ago. A few types of shoes have been invented to fit such feet without deforming them, and these were to be seen in the foot-health exhibition held recently at the Royal Sanitary Institute. The Roman philosopher, Posidonius, who died in 51 B.C., wore a charming shoe, (B) in fig. 2, with the toes quite free. The Roman lady of the 5th century wore a similar type (C) and so did the emperor (D). The *caliga* of the soldier (E) was a stoutly built iron-studded sandal, fastened

Fig. 1—Toes of a Burmese woman who had never worn shoes of European type.

with a thong between the first and second toe. The young Londoner of Tudor times wore, like his elders, a wide square-toed shoe with ample room for toe-spreading (F), but the 18th-century Dutch child wore a sharp-pointed constricting shoe (G), following the fashion set by the grown-ups.

The modern child is relatively well off in shoes which make some attempt to allow for toe-room (H) though the "straight inner border" rule is not always understood. As originally laid down by T. S. Ellis [1] in 1889, it requires the line of the inner border to touch the heel (I, continuous line), but the line shown in a diagram at the exhibition and put into practice in many children's shoes, though straight enough near the toes, falls away from the heel behind (I, broken line). When built for adults roomy-toed shoes have a clumsy appearance (J), as shown in Knowles's important paper,[2] and even so they do not give the freedom of the Tudor square-toed

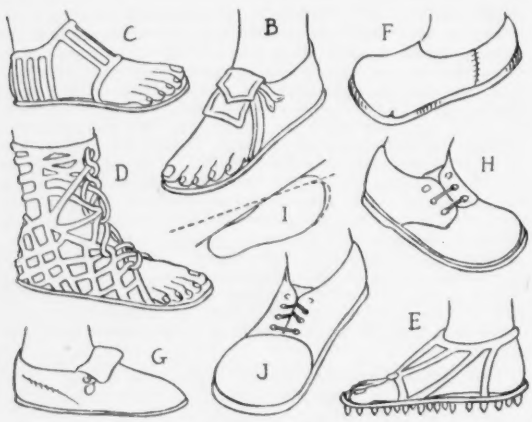

Fig. 2—Old and new fashions in footwear.

1. Ellis, T. S. The Human Foot. London, 1889.
2. *Med. J. Aust.* 1953, i, 579.

type. Such toe-caps perhaps look better on boots than shoes, but few women would wear them.

How then could the criteria for a non-deforming shoe be laid down? Dr. Booth (Feb. 27) has rightly discarded Dr. Emslie's suggestion (Feb. 13) that shaping the insole to the instep can help much, for however the insole is shaped and twisted, there is with a high heel, as Ellis [1] pointed out, "a constant tendency to slide forwards, driving the toes like a wedge" into the toe-cap. The test should rather be the absence of all contact between toes and toe-cap, best achieved in summer by the Roman type of open-toed shoes or sandal, and in winter by a wide, square-toed, Tudor type of shoe or boot. The contact test would at once exclude "court" type shoes, and most so-called sandals and peep-toe shoes as figured in our earlier letter (Jan. 16).

Fig. 3—Toes of another Burmese woman who had worn European shoes.

The exhibition cast of a "normal foot of an adult woman," mentioned by Mr. Pratt (Feb. 27), despite the presence of a 15° hallux valgus and the absence of any gaps between the toes, could not be forced into even the widest of the shoes adjoining it without further toe deformation.

Good fitting makes for comfort, but a badly designed shoe still deforms, however well fitted. Good materials might also be specified, so as to exclude the use of a cardboard "stiffener" at the heel which becomes a pulpy mass after a spell of wet weather. We understand that shoes for export must be accompanied by a certificate indicating the materials used in their manufacture, but that this does not apply to shoes sold here.

Mr. Hinton (Jan. 30) points out that women choose their shoes primarily for style and colour, and indeed it would be absurd to expect a manufacturer to risk capital in producing good, but to modern eyes, odd-looking shoes. But flat heels have become popular since the war, though they seldom appear in fashion magazines, and there is no reason why wide toe-caps should not follow them. Fig. 3 shows the effect of the best of the shoes available in a provincial town on another Burmese woman; she may lose her blisters but will keep her newly acquired hallux valgus for the rest of her life as a memento of her visit to this country.

One other point needs mention. Engle and Morton [3] looked for, but did not find, signs of fungal infection in the thousands of Belgian Congo natives they examined. Knowles [2] and Mr. Mottram (Feb. 13) have reported the disappearance of tinea pedis when they wore sandals or large boots, and its reappearance with return to ordinary shoes. It certainly looks as if toes crowded to form a "digital wedge," besides being deformed, are more liable to fungal infection than toes spread out freely.

Department of Anatomy, Sheffield University. R. WHEELER HAINES.
Orthopædic Department, Royal Infirmary, Glasgow. A. MCDOUGALL.

SIR,—Man's foot was designed to walk on the ground in warm or temperate climes, and usually on a flat hard surface. Perhaps flat hard surfaces are best for

3. *J. Bone Jt Surg.* 1931, **13**, 311.

feet. And perhaps "improved" shoe design is no improvement and should be classed as an "unnecessary operation" like some circumcisions, appendicectomies, and tonsillectomies. Surely the logical conclusion to these "improvements" would be to support the foot in a specially designed shoe to "fit" each individual foot, complete with sponge rubber insole and crêpe outer sole; the result might be loss of all muscle tone and atrophy of the muscles.

As for flat-feet, there is the story about the hundreds of Red Indians who walked 1000 miles to enlist in the American Independence Army: they were turned down because they had flat-feet, so they walked home again.

STUDENT NURSE.

THE RECENT BURN

SIR,—I agree with Dr. Gardner (Jan. 16) that it is better to leave blisters intact when dealing with minor burns in industry.

My method is to clean the blister and surrounding skin, and then with sterile needles make drainage channels from the blister. This is done by running the needles under the skin about 1/4 in. from the blister. Gentle pressure is applied until the blister is drained. A sterile dressing is then applied. This treatment may have to be repeated.

The patients continue working, because pain is immediately relieved; and there is little or no risk of infection.

Cape Town. I. YATES.

FULL-TIME—PART-TIME

SIR,—The correspondence in the medical press about the delayed application of the betterment factor to consultants' salaries has tended to suggest that the part-timer has an unfair financial advantage over the whole-timer. It would be deplorable if a wrangle were to develop between these two groups of consultants, but, while we have every sympathy with the claims of the whole-time workers, we should like to emphasise that many part-time consultants are often worse off than their whole-time colleagues.

We write as maximum part-time consultants in medical specialties with appointments at hospitals both inside and outside Greater London. Visits once or twice a week to each hospital are no sinecure and may well continue late into the evenings. The furthest hospital is over 30 miles distant and our professional mileage is about 12,000 per annum. This also includes occasional visits to neighbouring hospitals and emergency hospital calls. The use of a car is for each of us a necessity and, although partly recompensed for routine professional motoring expenses, we are bound to find the means to purchase a new car about every four years. In this way we resemble the average general practitioner rather than the whole-time consultant whose work is confined to a single hospital near his home.

The introduction of consultant services to non-teaching hospitals in poor districts means that the part-time consultant who visits only this type of hospital, particularly on the fringe of London, may through no fault of his own develop hardly any private practice. It may be little more than sufficient to pay the rent of a consulting-room and, unless he can afford to employ a private secretary, he will as likely as not have to type his own letters.

Income-tax allowances on private-practice expenses are largely dependent upon the amount of independent income earned. It is quite clear, therefore, that the more modest the private earnings, the less likelihood is there of full expenses being allowed.

While there is certainly a case for whole-time consultants to be paid for domiciliary visits, there seems to be an exaggerated conception of the number of domiciliary visits carried out by part-time consultants. In some parts of the country and in some specialties the maximum number may be made, but this is most unusual in the areas in which we work. Our own experience, and that of other part-time colleagues whom we have questioned, is that it is unusual to attend more than 25 domiciliary consultations a year. It would be interesting to know the average figure.

We hold no financial grievance against our whole-time colleagues and we feel that part-time consultant work has many non-economic advantages. We believe, however, that it is time to modify the apparently widespread belief that all part-time consultants earn considerable private incomes, regularly make 200 domiciliary visits a year, and obtain large and unjustifiable income-tax allowances.

London, W.1. TWO JUNIOR PART-TIME CONSULTANTS.

SIR,—I feel that some of the points made in Dr. Gilchrist's letter of March 13 cannot go unanswered.

Dr. Gilchrist states that "unity amongst specialists is not fostered by insinuations about the work done by whole-time and part-time staff." With this I fully agree, but Dr. Gilchrist does not help such unity by his comments upon the constitution and work of the Joint Committee for Consultants and the staff side of the Whitley B Committee. He states both committees have always looked after the interests of part-timers even when it meant sacrificing those of whole-timers, as in the mileage-allowance negotiations. This statement is completely out of accord with the facts. The Whitley B Committee has not only endeavoured repeatedly to impress upon the management side of the committee the just claims of whole-timers in relation to domiciliary consultations, mileage allowances, and legitimate expense allowances, but also arranged a special session of the Whitley B Committee to which three whole-timers, nominated by the Whole-time Specialists Association, were coöpted, so that the whole-timers themselves could put their case to the management side of the committee. As a member of the committee I was present on that occasion, and the case for the whole-timer was put extremely forcefully and ably by these representatives, and was fully supported by the whole of the staff side of the committee. Unfortunately no concession whatever was obtained from the management side, which remained as obdurate as before; but in their reply the management side emphasised that they had heard all the arguments put forward by the whole-timers before.

It is thus apparent from the management side's own lips that Dr. Gilchrist's statement that the Whitley B Committee has always looked after the interests of part-timers and sacrificed those of whole-timers is quite incorrect. I am surprised that Dr. Gilchrist is not aware of these facts.

Finally, Sir, Dr. Gilchrist is incorrect in saying that there are 15 part-time consultants and 1 whole-time consultant on the staff side of Whitley B. There are in fact 14 part-time and 2 whole-time consultants, and unity would not be further fostered by having separate electorates for whole-timers and for part-timers.

Winchester. H. H. LANGSTON.

SIR,—You have one type of reader who has studied with sour equanimity the recent correspondence concerning the salaries of S.H.M.O.s and of consultants, whether they be full-time or part-time.

I refer, of course, to the depressed class of registrars, many of whom are now approaching, or have passed, their fortieth year. They, too, have been known to have children to educate and houses to buy. To them the salaries of S.H.M.O.s, consultants, and general practitioners appear princely.

Surely, Sir, first things must come first in this struggle for money. Let registrars be given at least enough, if

necessary by annual increment or according to experience and qualifications, before more sops are thrown to these other already more fortunate classes who are also more influential and more clamorous.

Ipswich. EDWARD ELMHIRST.

A PHILOSOPHY OF HEALTH

SIR,—As one who has shown in his writings that he is not in harmony with many of the current practices of the art of medicine, I was expecting to be "damned with faint praise" for my philosophy of health. I was not expecting that you would completely falsify my main thesis as you have done in the review in your issue of March 13.

You take the meaning of the conjunction "or" to be solely exclusive, as in guns or butter, ignoring the meaning of identity, as in scarlet fever or scarlatina. You say that I oppose happiness and health—"the author fairly gives the choice between living happily or healthily." This is quite untrue. It is shown in my book that the definitions of health and happiness are exactly the same and that there is no austerity in the system. The theme throughout is that true happiness and true health are synonymous terms. If you had said "the author fairly gives the choice between living happily in a brutish way or living healthily," you would have been absolutely justified.

Bristol. A. T. TODD.

CONTROLLED HYPOTENSION WITH ARFONAD

SIR,—The two articles on this subject in your issue of Feb. 13 lead us to add our experiences in rather more than fifty cases.

We have been using the same technique as Dr. Scurr and Dr. Wyman—i.e., continuous intravenous infusion of a 1/1000 solution in saline. We feel that, with such a short-acting drug, this is a more logical and controllable method than intermittent dosage.

Our results and conclusions are very similar. We find that the essential part of the technique is a slow and deliberate induction of hypotension, and that to ensure success no surgical interference should be permitted until the pressure is stabilised at the required level. Rapid induction results in complete loss of control of pressure, as happened in our first case.

A maximum of 60 drops per min. at the beginning of induction should not be exceeded. In most cases, this is enough to reduce the pressure to the required level within five minutes. Healthy young people require greater doses. Hypertensives respond very readily to the drug.

Prolongation of effect is, in our opinion, invariably due to overdosage. There appears to be a "floor" below which the pressure will not fall in many cases; and if administration is continued at a constant rate when this is reached, a cumulative effect is produced, with resulting prolongation. This is reversible with small doses of methylamphetamine ('Methedrine') (5–15 mg.). Once we achieve the required level, we reduce dosage to the minimum, so that the pressure is tending to rise.

There have been 3 failures, all of them involving operations on the head and neck (2 aural fenestrations and 1 block dissection). In all 3 cases the systolic pressure was 60 mm. Hg—, but continuous oozing occurred. This we attribute to the position of the head during operation and consequent obstruction of the great veins in the neck.

In our series there have been no attributable deaths. The patients' ages ranged from 30 to 73, the average being 50.

Postoperative hæmorrhage will occur unless the pressure is allowed to return to 100 mm. Hg+ before closure.

The difficulty in controlling an extremely slow rate of infusion has been said to be a disadvantage. We are at the moment in the process of constructing an apparatus capable of delivering 1–60 drops per min.

We feel that 'Arfonad,' because of its evanescent effect and consequent easy management, is a great advantage in hospitals where there is no "recovery unit," with fully trained staff, to supervise the patients. It is a great solace to the ward sister and all concerned if the patient returns to the ward in approximately the same condition as he left. It is, however, not a technique that should be embarked upon lightheartedly by anyone who does not realise the dangers inherent in induced hypotension. We agree absolutely with Dr. Scurr and Dr. Wyman when they stress the contra-indications and the necessity for perfect oxygenation throughout.

S. G. DE CLIVE-LOWE
Guildford, Surrey. J. NORTH.

RECURRENCE OF SIMPLE PAPILLOMATA OF THE BLADDER

SIR,—In an article in your journal last year [1] I reported three cases of recurrence of simple vesical papillomata after the lapse of 23, 24, and 28 years respectively. I would now like to call attention to another case in which the lapse is 16 years.

The patient, a man, aged 59, was given a single cystoscopic diathermy treatment by me for a simple papilloma of the bladder in 1938. I have made regular annual cystoscopic inspections of the bladder ever since and have always found it free of any signs of new growth, until yesterday, March 17, when the routine annual cystoscopy revealed the presence of seven small sessile papillomata which all appeared to be simple in character. There had been no hæmaturia or other symptom to suggest recurrence since 1938.

This case is but another one which reminds us that with patients who are apparently cured the regular yearly cystoscopy must always be continued. I feel it is wise to put all such cases on record.

London, W.1. H. P. WINSBURY-WHITE.

THE EPILEPTIC AND HIS DRIVING LICENCE

SIR,—Everyone is rightly agreed that a person suffering from epilepsy must not drive a car under any circumstances, because of the risk of a fit causing an accident. It has been my practice up to the present, when consulted on this question, to advise my patients to hand in their driving licences. In due course many lose their fits completely, and my practice is to certify after a certain period of such freedom that they no longer suffer from epileptic fits. This period varies from three to five years according to the severity and frequency of the original attacks and according to the electro-encephalogram.

It is commonly said that two of these years must be without even minimal doses of sedative, but this view may be open to question, particularly as many patients are unwilling to abandon all treatment, although they are quite content with a dose so small as to be little more than a placebo.

Recently I gave evidence in court on behalf of a patient with infrequent nocturnal grand-mal attacks, who had voluntarily surrendered his driving licence in 1950 and had been free from attacks since then. He was appealing against the revoking of his new licence and, unfortunately, he had refused to abandon his half-grain of phenobarbitone except for a week prior to an electro-encephalogram, which was normal. His appeal was dismissed because it was said in court on behalf of the county council that the Ministry of Transport require five years' freedom, with at least two years without treatment.

This decision, however, raises two points. Firstly, I know he could have obtained a driving licence in another county after only two years' freedom from attacks; and, secondly, it may be that I exceeded my duty to my patient by advising initially that he should surrender his licence, for he has been put to considerable trouble and legal expense in his attempt to recover it. Perhaps in the future I should advise such patients not to drive until I can certify to them that their epilepsy appears to be fully controlled.

1. Winsbury-White, H. P. *Lancet*, 1953, i, 757.

Obviously the interests of public safety come before those of the epileptic and no risk can be taken, so that perhaps four or five years' freedom is safer than three. Since epilepsy, like diabetes and pernicious anæmia, can only be controlled rather than cured, it seems illogical to require any of this five-year period to be free of treatment, on condition that the patient is known to be completely reliable in the matter of taking his anticonvulsant therapy.

London, W.1. A. BARHAM CARTER.

WELCOME TO THE SANATORIUM

SIR,—I agree with X.Y.Z. who in his letter of March 6 draws attention to the Regulations for Adult Patients with which potential patients to a certain sanatorium are entertained before admission. Unless this is a stock form shared by sanatoria in general then I happened to be a patient in this particular place. I remember wondering at the time how the words "pauper" or "inmate" had come to be omitted from this poor-law bit of literature. If nothing else, these regulations are bad manners.

I have other memories.

The rules of this place were so draconian that I feel sure that they often provoked misbehaviour. General hospitals do not have to issue these formidable regulations. Patients only need the opportunity to respond as human beings to human beings. I should not have to mention this, especially in connection with those who treat tuberculosis—surely one of the most "psychological" of all the physical diseases.

EX-PATIENT.

PATHOLOGISTS AND PNEUMOCONIOSIS

SIR,—I agree with Dr. Fletcher's point last week that the pathological classification of pneumoconiosis is less developed than is the radiological, but in the rest of his letter he comes down rather like a ton of bricks upon Dr. Triger—or should it be a ton of dusty Welsh coal?

We must be careful not to generalise too much from the Welsh experience. Not all coalminers are Welshmen, and there are differences in the coal dusts from other areas, in the industrial geography, in the availability of work, and in the frequency distribution of the various categories of X-ray pictures which are seen, and in other variables.

The radiograph, with its classification system and its observer error, is merely the shadow of this problem. The substance is the disability. What is the relation between the two? If we define disability as inability to continue with the man's present coal-face job—and this is what disability means to the miner and to the industry—we have found in County Durham that within each 5-year age-group there is no relation at all between the X-ray picture and disability until very gross (complicated categories) changes are seen. This survey considered 5118 miners in four geographically different collieries using different working methods. 88% of the men were radiographed, and their films were viewed by three different viewers at separate times. The viewers did not know each other's opinions or the occupational histories of the miners.[1] We must not fall into the logical error of supposing that because a man has some technical abnormality in his chest film he is therefore "disabled." Neither must we forget that both emphysema and chronic bronchitis are in the background of this problem, both adding their quota to the disability, but neither can be detected by radiology.

There is a real danger that numbers of coalminers will be given the impression that they are ill or will shortly become ill with a grave disease, *pneumoconiosis*, merely because their chest films show a technical change. In another industrial disease of coalminers, nystagmus, it has taken three-quarters of a century for it to become even partially realised that the physical sign of oscillation of the eyes does not correlate with disability, and we may be heading for the same position in pneumoconiosis.

1. McCallum, R. I., Browne, R. C. Prevalence of Pneumoconiosis in Four Durham Collieries. 1954. To be published.

Medical School, King's College, Newcastle upon Tyne, 1. R. C. BROWNE.

SIR,—The letter from Dr. Triger (March 13) raises issues of the greatest importance. He asserts that as a pathologist he is unable to substantiate at post-mortem examination the clinical diagnosis of pneumoconiosis. So much in this disease, as in many others, depends on the criteria used.

For many years now miners have watched their fellow workers, and often themselves, becoming increasingly crippled by disease due to inhalation of coal and other dust. They have often termed this condition miners' asthma. It included, of course, silicosis, pneumoconiosis, chronic bronchitis, emphysema, and subsequent asthma. The last three of these conditions are crippling and kill many men. Pathologists often say they are not due to dust.

Surely we want to know what makes the miner cough—for it is the persistent cough which passes gradually into "chronic bronchitis" and subsequent lung changes. It is these we have to prevent. I think the Coal Board could easily obtain figures of the cause of death in miners. These would probably show that terminal pneumonia, and heart-failure secondary to long-standing lung disease, kill many more men than certifiable pneumoconiosis. I know of one mining village in which 87 miners have died since the war and 42 of these from chest disease; of these only 2 had certified dust lesions. The pits in which these men worked are regarded as clean.

Our profession will regain the respect of the miners when we tell them which symptoms are due to dust inhalation and when we really help in preventing not only post-mortem changes but the prolonged morbidity preceding death. Finally, I would remind Dr. Triger that 4500 people died from the great fog in London in December, 1952. At necropsy there was no fog in their lungs.

Central Middlesex Hospital, London, N.W.10. HORACE JOULES.

SIR,—Dr. Fletcher, in his letter last week, uses an imposing array of quotations in order to prove his point—namely, that clinical and radiological diagnosis of industrial dust disease is more reliable than post-mortem diagnosis, or, in other words, that the shadow should be preferred to the substance. Dr. Fletcher would have made his argument very much more convincing if, instead of various quotations, he had supplied one single figure in support.

Dr. Fletcher writes about "sampling errors." Surely he cannot be unaware that under the law of this country every death where there is even a remote suspicion of connection with industrial dust disease is considered an unnatural death and has to be reported to the coroner, who invariably orders a post-mortem examination. The question of sampling error just does not arise.

As for the "uncharted errors of the pathologists," I am certainly the last person to suggest that no wrong post-mortem diagnosis is ever being made, but the examples cited by Dr. Fletcher are irrelevant. A pathologist is perfectly at liberty to call dust deposits in the lungs of town-dwellers "pneumoconiosis," but he would certainly not call them "industrial dust disease."

My letter (March 13) may have been "an example of unwarranted self-confidence," but at least it endeavoured to draw attention to an undoubtedly

real problem—namely, the discrepancies between intra-vitam and post-mortem diagnoses of industrial dust diseases.

I would point out that I am not a "post mortem pathologist"; I examine clinically and (up to a recent date) radiographically many more cases of industrial dust disease than I see post mortem. So the observer error is present both ways and, one hopes, cancels itself out to some extent.

Abertillery, Monmouthshire. K. TRIGER.

POLIOMYELITIS IN CHILDREN'S WARDS

SIR,—Dr. Stanley Banks (Feb. 27) draws attention to the exceptional but not unimportant outbreak of poliomyelitis among the patients in children's wards of various hospitals in the London area during the summer and autumn of 1953. I was greatly interested in certain points in this series of cases: firstly, these children were presumably infected in the wards; secondly, in the majority, penicillin injections probably determined the high incidence of paralytic poliomyelitis; and thirdly, in all these patients, the paralysis was limited to the limbs injected.

In the light of these observations, I think it may be useful to record the cases of 2 children who had paralytic poliomyelitis, one following a course of corticotrophin (A.C.T.H.) injections for type-II nephritis, and the other during treatment with intramuscular and intrathecal streptomycin for tuberculous meningitis. Before this complication, these children had been nursed for 3 and 6 weeks respectively in an open children's ward, but in two separate hospitals, in Derby during the summer of 1953. In both instances, cases of lymphocytic meningitis were admitted to the wards 20 and 32 days before the onset of paralysis in each of these patients. Such cases may have been relevant sources of contact.

CASE 1.—A boy, aged 5, was admitted to this hospital on July 15, 1953, suffering from a relapse of type-II nephritis. A course of short-acting corticotrophin was started 14 days later, and was continued for 8 days. The intramuscular injections were given four times a day into the thighs. Vomiting and diarrhœa were noted on the 7th day of treatment, and fever, headache, and injected fauces followed on the 8th day when treatment was discontinued. On the day following withdrawal, neck rigidity was present, and next day there was paralysis of the left leg and paresis of most muscle groups of the right leg. Paralysis was greatest at the onset, and no subsequent extension was observed. The cerebrospinal fluid showed characteristic findings.

CASE 2.—A girl, aged 5, was admitted to another hospital on June 18, 1953, suffering from a relapse of tuberculous meningitis. In the 6th week of treatment, while receiving intramuscular and intrathecal injections of streptomycin (via lumbar route) as well as oral *p*-aminosalicylic acid, isoniazid, and vitamin-B complex, she complained of inability to move the left leg. There was a moderate rise in temperature, and signs of meningeal irritation appeared. A complete lower-motor-neurone paralysis of the left leg was followed 24 hours later by similar findings in the right leg and by considerable weakness of the abdominal and spinal muscles. Chest movement became temporarily uncertain on the 3rd day. Thereafter, no extension of the paralysis was noted. There were no sensory changes or signs of spinal block. The interpretation of the cerebrospinal fluid findings presented difficulties, but an increase of lymphocytes from 40 to 100 per c.mm., and of protein from 50 to 180 mg. per 100 ml. may have been significant. Radiographs of lumbar and dorsal spine revealed no abnormality. All intramuscular injections in this child were given into the right thigh only, and, at the time of the paralysis, there was considerable painful induration at this site. Intrathecal injections were discontinued at the onset of the illness.

There is a strong possibility that, in the first patient, the corticotrophin injections were in part responsible for the paralysis. The sequence of events, notably the severe paralysis greatest at the onset and the localisation to the injected limbs, is the usual one in paralytic poliomyelitis after inoculation or other injection within the preceding 4 or even 8 weeks. This was the pattern observed by Dr. Banks in children infected in the wards, and there has been similar evidence in most previous studies of post-inoculation poliomyelitis.

The circumstances in the second case, however, were not entirely comparable. Injections were given both intramuscularly and intrathecally. The first sign of paralysis was in the lower limb which had not been injected, and, furthermore, the paralysis later progressed to the abdominal and spinal muscles, and finally threatened the chest wall. It is possible that such sequelæ may not have been related alone to the intramuscular injections, but also, or entirely, to the daily intrathecal injections of streptomycin, which may have been as traumatic as the intramuscular injections. The irritant is introduced directly into the spinal fluid and into close contact with the motor roots and the anterior horn cells, and the vulnerability of these cells may therefore be considerably increased. I think this hypothesis may account for the precipitation and the localisation of paralysis in this patient. This raises the question whether it would be correct to classify intrathecal injections with inoculations and intramuscular injections as potential risks during the epidemic seasons.

Hitherto, attention has been chiefly directed to the risk of post-inoculation poliomyelitis during the epidemics. In his excellent letter, Dr. Banks emphasises the same dangers in relation to penicillin injections. Geffen et al.[1] have lately quoted the work of Korns et al.,[2] who showed that the risk of poliomyelitis is doubled during the 2 months following an injection of an immunising substance, penicillin, or other materials. This increasing awareness of the connection between paralytic poliomyelitis and injections of all kinds suggests, as Dr. Banks has indicated, a need for definite steps to avoid the dangers. These dangers, especially as they apply to children in open wards, should make us cautious in the use of intramuscular, and possibly intrathecal, injections during poliomyelitis seasons.

I wish to thank Dr. D. V. Hubble for permission to publish these two cases.

Derbyshire Hospital for Sick Children, Derby. ANN FERGUSON.

Public Health

An Overloaded Sewer

FOR a few minutes on Wednesday, March 10, readers of the *Times*, in trains and omnibuses and country parsonages, were joined by a bond of generous if transitory sympathy towards the householder of Ilford who sought an injunction to restrain the borough council from flooding his garden with sewage. Last year this happened eleven times and Mr. Justice Upjohn found (with reason, we think) that it caused the householder and his family grave inconvenience. Alas, the learned judge, guided by statute and precedent, was compelled to say that he could do nothing about it. The sewers were known to be overloaded and the council wished to replace them but had not been allowed to borrow the money for the purpose. The council had built since the war many houses which discharged into this sewer and contributed to its periodic high tides, but by law they were compelled to allow this discharge. There was no reason to think that the council managed their sewerage negligently. To establish liability for continuing a nuisance by failing to prevent it, it was necessary to prove that the person so failing was in a position to take effective steps to that end. In short the householder could obtain no legal redress. His only remedy was to complain to the Minister.

1. Geffen, D., Hamilton Paterson, J., Tracey, S. M. *Lancet*, 1953, i, 1268.
2. Korns, R. F., Albrecht, R. M., Locke, F. B. *Amer. J. publ. Hlth*, 1952, **42**, 153.

Census by Counties

The General Register Office has analysed the 1951 census figures by counties, and the fourth county in England and Wales to have its figures published [1] is Surrey. Others in the series will appear at short intervals. These reports include most of the statistics of predominantly local interest, such as populations and acreages of local government, parliamentary, and petty sessional areas, and the distribution of local populations according to sex, age, and marital condition.

Obituary

ROBERT AITKEN
M.D. Edin., F.R.C.P.E.

Dr. Robert Aitken, physician to the skin department of Edinburgh Royal Infirmary and lecturer in skin diseases in the University of Edinburgh, died on March 17 at the age of 66.

He was educated at Daniel Stewart's College, Edinburgh, and graduated as M.B. at the university in 1911. After a period in general practice, he came under the spell of Sir Norman Walker, and in 1913 served as his house-physician in the skin department of the Royal Infirmary. In 1915 he proceeded to his M.D., being highly commended for his thesis; in 1917 he took the M.R.C.P.E.; and in 1921 he was elected F.R.C.P.E.

In 1924 he was appointed assistant physician in the skin department at the E.R.I. and he became a full physician in 1933, holding this post until he retired last year. He was also dermatologist to Perth Royal Infirmary and Leith Hospital.

His published work included two books *Ultra Violet Radiations and their Uses* and *The Problem of Lupus Vulgaris*, but there could be no doubt that his great dermatological passion was cutaneous tuberculosis, for he had an intense sympathy with its victims. He was responsible for organising a Finsen-Lomholt department for the treatment of lupus vulgaris, in addition to the general ultraviolet department, of which he had charge. In 1950 he was president of the British Association of Dermatology.

G. A. G. P. writes: "From his father, Aitken inherited a love of the sea and he was proud to serve in the R.N.V.R. during the first world war. Though serious cardiovascular disease debarred him from energetic sport, his pleasure in sailing his cabin-cruiser amply compensated him for this and he held the yachtsman's coastal certificate. Among his other interests were photography and music, and he was also a fellow of the Royal Society of Edinburgh and a past president of the Royal Scottish Society of Arts. It is sad to think that he was not permitted to enjoy his retirement, but he had been dogged by constant ill health for the last two years."

Dr. Aitken leaves two sons, one of whom is a doctor.

RALPH LINTON
M.A., Ph.D.

Ralph Linton, Sterling professor of anthropology at Yale University, died on Dec. 24, only a few weeks after giving the Salmon lectures which we discussed in our editorial of Dec. 26, entitled the Culture and the Breakdown.

A member of an old Quaker family, he was born in Pennsylvania, and graduated as B.A. at Swarthmore College in 1915, and the following year as M.A. at the University of Pennsylvania. As an anthropologist he had worked in Guatemala, Polynesia, Madagascar, and East and South Africa, and he had held chairs in his specialty at the University of Wisconsin and at Columbia University before going to Yale in 1946. From 1938 to 1944 he was editor of the *American Anthropologist*, and from 1945 of the *Viking Anthropological Papers*. In 1946 he was president of the American Anthropological Association. Owing to cardiac disease he had lately had to restrict his physical activities, but he continued to lecture to graduate students. Last year he was awarded the Huxley medal of the Royal Anthropological Institute of Great Britain and Ireland. For some time he had been working on a *History of Civilisation* which was to be published in 1955.

S. Z. writes: "As his lectures showed, Linton was deeply concerned with the application of his science to social and political problems. In the preface to *The Science of Man in the World Crisis* (1945), he underlined his conviction that the builders of the new world order 'are foredoomed to failure unless they understand the potentialities and limitations of their human material.' What he felt science could bring, or should bring, to the solution of social problems were 'clarity and a broader, unifying view,' two things which were, he believed, essential in the treatment of racial minorities such as the American Indian. He held firmly that a clear scientific appraisal of the facts would help to eliminate racial prejudice and injustice, and his own field studies had much to do with his belief that 'although Man is beginning to learn to stand on his own feet and to accept responsibility for the working out of his own destiny, this does not diminish his need for immediate reassurance. In the past he always turned to his gods for the explanation of present calamity and for advice on how to mitigate it. These two are equally necessary for his peace of mind. Discomforts become somehow more bearable if their causes are understood. Today he turns with the same blind faith to the new god, Science.'"

1. Census, 1951: County Report, Surrey. H.M. Stationery Office. 21s.

Births, Marriages, and Deaths

BIRTHS

WOOTTON.—On March 6, at Hammersmith Hospital, to Veryan, wife of Dr. I. D. P. Wootton—a daughter.

Diary of the Week

MARCH 28 TO APRIL 3

Monday, 29th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. A. B. Nutt: Congenital Ocular Palsies. (Hunterian lecture.)

Tuesday, 30th

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. A. R. French: Medicolegal Problems and the Dermatologist.

ROYAL SOCIETY OF ARTS, John Adam Street, W.C.2
5.15 P.M. Sir Arthur Porritt: Experiment of a State Medical Service in New Zealand.

ROYAL STATISTICAL SOCIETY
6 P.M. (Westminster Medical School, Horseferry Road, S.W.1.) *Study Circle on Medical Statistics.* Mr. N. T. J. Bailey: Queueing for Medical Care.

Wednesday, 31st

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Mr. W. E. Tucker: Injuries in Sport.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Cytodiagnosis in Dermatology.

Thursday, 1st

ROYAL COLLEGE OF SURGEONS
5.30 P.M. Mr. G. A. Mason: Tumours of the Lung

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 5, Lisle Street, W.C.2
5 P.M. Dr. W. N. Goldsmith, Prof. C. Rimington, F.R.S., Dr. A. D. Porter: Photosensitivity.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Staff House, University of Manchester.) *Section of Anæsthetics.* Dr. A. R. Hunter: Hypotension with a Short-acting Drug. Dr. G. J. Rees: Second Thoughts. (Joint meeting with Liverpool Society of Anæsthetics.)

Friday, 2nd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. Prof. J. H. Burn, F.R.S.: Actions of Chlorpromazine and Promethazine.

LEEDS AND WEST RIDING MEDICO-CHIRURGICAL SOCIETY
7.30 P.M. Sir Francis Walshe, F.R.S.: Some Lessons Learned in Consulting Practice.

Saturday, 3rd

KENT PÆDIATRIC SOCIETY
3 P.M. (Royal Star Hotel, Maidstone.) Sir William Hamilton Fyfe, LL.D.: Some Platitudes on Education.

Notes and News

THE SENSE ORGANS

SPEAKING at the Royal Society of Arts on March 17, Prof. E. D. Adrian, O.M., P.R.S., said that there is usually fairly close correspondence between the signals from the sense organs and the sensations experienced, but in the phemonena classed as sensory adaptation this correspondence does not hold good. A persistent stimulus may give a persistent impulse-discharge but a sensation which soon dies away; this happens with sensation of temperature and of smell. For mankind the information conveyed by visual messages usually has the highest significance; we rely less on sounds and can turn a deaf ear to them, and rely so little on smell that we can only notice an odour when it is relatively recent. We know very little about the brain's methods of directing our attention one way or another. Alteration in the electro-encephalogram from opening and closing the eyes, or from concentrating attention on non-visual stimuli or on mental arithmetic, suggests ways of obtaining more knowledge about this. We can map out on the cerebral cortex various areas corresponding to the sense organs of the body-surface. Secondary areas of sensory representation in the cortex have more recently been discovered, mostly in anæsthetised animals but also in man. These are probably part of a more primitive brain organisation, since they are connected with the more primitive parts of the cerebellum, whereas the first areas are connected with those parts of it which are most highly developed in monkey and man.

Magoun and Jasper and other American workers have shown yet another destination of sensory signals in a diffuse mass of nerve-cells at the head of the brain-stem—the reticular formation. This region seems to control the general level of activity in the brain; when it is stimulated the cortical cells are more readily excited; it may therefore act by alerting the brain when it receives any type of sensory signal.

This does not bring us much nearer to an understanding of how attention ranges from one thing to another, but it seems that the reticular formation is an important factor in deciding how much attention is available. We are still a long way from understanding how the detailed analysis of information from the sense organs, the abstraction of patterns that fit in with those already laid down, the arousing of emotional activity, and so forth, takes place in the immense mass of the cerebral hemispheres. We may find in the end that our brains are too elaborate for us to understand, but it is worth trying to do so by tracing the fate of the sensory signals on which they have to work. Fresh information about the action of the sense organs may be leading us up a blind alley—but it is an interesting place for the physiologist to explore.

THE PAYING PATIENT

IN our annotation last week we referred to schemes for insurance against the cost of private treatment in hospital or nursing-home, and mentioned two of the organisations which offer this insurance. Another such organisation is the British United Provident Association—a non-profit-making association, under the presidency of Lord Nuffield, which was formed in 1947 by amalgamation of provident associations and extended benefit schemes in many parts of the country. Subscribers have the choice of four scales of subscription. For an annual subscription of £5 a subscriber aged 25–34 can obtain in a single year upwards of £250 in benefits. For an additional £3 he can obtain the same benefits for his wife, while a further £2 will also cover all his children under 18 years of age. The benefits are payable for institutional maintenance and treatment, for outpatient treatment, and for home nursing. The association's head office is at Provident House, 25, Essex Street, Strand, London, W.C.2.

A LOCAL STUDY OF B.C.G. VACCINATION

THE vaccination with B.C.G. of the Pirquet-negative nurses of Ullevaal Hospital, Oslo, in 1927 and onwards by Heimbeck and his colleagues was accompanied by a modest side-show of which nothing has hitherto been heard. Heimbeck[1] now reports that he selected the isolated community of Sollia, with a population of about 400 and a reputation for much tuberculosis, for an intensive study. He tested 360 of these people, and found 172 to be Pirquet-positive and 188 to be Pirquet-negative. A subcutaneous injection of 0·05 mg. of B.C.G. from the Pasteur Institute in Paris was given to 147 of these negative reactors. From the autumn of 1927 to the spring of 1953 the population of Sollia was kept under close supervision, and the final examinations in 1953 were made by Heimbeck himself. Among the 172 persons who were initially Pirquet-positive the tuberculosis morbidity was 2·4, and the tuberculosis mortality 2·4, per 1000 observation years. Among the 41 Pirquet-negative persons not vaccinated, the tuberculosis morbidity was 2, and the tuberculosis mortality 1, per 1000 observation years. In the group of 147 persons vaccinated with B.C.G. there was no tuberculosis morbidity or mortality.

1. Heimbeck, J. *Tidsskr. norske Lægeforen.* Dec. 15, 1953.

HOSPITAL COSTS IN SCOTLAND

IN Scotland during the year ended March 31, 1953,[1] the average cost of maintaining a patient in hospital, excluding specialists' salaries and overhead charges for unoccupied beds, was £7 18*s.* 9*d.* per week, distributed as follows:

	£	*s.*	*d.*
Patient's food, drugs, dressings, and laundry ..	1	15	9
Staff salaries, food, laundry, &c.	4	1	0
Maintenance of buildings and other overheads ..	1	15	0
Board of management administration		7	0

The national averages for the cost of maintaining and treating a patient in the different types of hospitals for the two years 1951–52 and 1952–53 were:

	1951–52			*1952–53*		
General hospitals:	£	*s.*	*d.*	£	*s.*	*d.*
1–50 beds	8	16	9	9	10	2
51–300 beds	9	18	11	10	6	3
Over 300 beds	11	4	0	11	10	3
Teaching	10	10	7	11	3	1
Maternity	14	7	7	15	7	3
Convalescent	5	3	10	5	2	10
Sanatoria	8	1	0	8	11	7
Infectious diseases	9	6	8	9	18	1
Mental	4	8	1	4	14	2
Mental deficiency	3	19	4	4	7	7
Special	7	13	5	8	0	0

The average cost of treating an outpatient was 17*s.* 8*d.* per case or 4*s.* 11*d.* per attendance. Attendances totalled 4,989,373.

SURGERY OF ULCERATIVE COLITIS

READERS of the leading article on this subject in our issue of Feb. 20 may like to be reminded of Mr. R. S. Corbett's experience with cases of ulcerative colitis in which he has performed colectomy but has preserved the rectum. Speaking at the meeting[2] of the section of proctology of the Royal Society of Medicine to which we referred in our leader, Mr. Corbett described the results in 12 patients whose treatment included ileorectosigmoid anastomosis: 8 of the 12 patients had done very well, and he concluded that a return to rectal control should be considered in certain cases. This aspect of treatment was previously discussed by him in a lecture[3] at the Royal College of Surgeons in 1951.

TOTAL GASTRECTOMY FOR GASTRIC CARCINOMA

ON Feb. 24 Dr. Bjarne Fretheim successfully defended his M.D. thesis in the University of Oslo. This concerned total gastrectomy by the abdominothoracic route for carcinoma of the stomach in 178 cases at the Rikshospital, Oslo, between 1946 and 1952. Of the 178 patients 31 died in hospital sooner or later after the operation (operation mortality 17·4%). Of 135 patients discharged from hospital, 72 (53%) died within a year of the operation, while 25% survived for more than two years and 18% for more than three years. All the patients who were still alive a year after discharge had some complaint or other; but in 21% this was negligible, and the longer the interval since operation the higher the proportion of patients who found their discomforts inconsiderable.

TRAINING HOSPITAL COOKS

A NATIONAL scheme for training apprentice cooks in hospital under the National Health Service has been drawn up by the Whitley Council concerned with pay and conditions of service of domestic workers in hospital.[4] Boys and girls are to be apprenticed from school-leaving age for a period not exceeding 5 years. Their training will cover all aspects of

1. Analysis of Running Costs of Hospitals in Scotland. H.M. Stationery Office. 8*s.* 6*d.*
2. *Proc. R. Soc. Med.* 1953, **46**, 1028.
3. *Ann. R. Coll. Surg. Engl.* 1952, **10**, 21.
4. A.S.C. circular 32; H.M. (54) 22.

cooking and they will also be able to study for the City and Guilds of London cookery diplomas. Male apprentices may secure deferment from National Service until they have completed their training.

LEPROSY IN INDIA

IN India leprosy is one of the graver problems. Under the five-year plan provision has been made for establishing a leprosy institute, and the health ministry is also considering pilot projects in certain areas. The Gandhi Memorial Trust has set apart 9 million rupees for combating the disease, and State governments and local authorities are evincing increasing interest in it. More isolation centres and more devoted workers are, however, needed all the time. The international conference of experts on leprosy lately held in India concluded that a change of emphasis is necessary in future plans. The stress has to be shifted from mainly institutional work of treatment and disposal of cases to work in groups of villages and to the rehabilitation of the cured. It is vital, also, to dispel the aura of hopelessness surrounding the disease. At the conference the work done by Christian missionaries in India and elsewhere in the tropics was gratefully acknowledged by the health minister, Rajkumari Amrit Kaur.

MEDICAL FILMS

NEW films include fine examples of the cinemicrography developed by Scubothe, Gross, and Haefeli.

Cold Agglutination of Human Blood (16 mm. silent, partly in colour) is a 17-minute film showing the reversible clumping of red blood-cells which occurs on cooling and the characteristic "sticky masses" formed by the red cells at low temperatures. Clinical applications are included.

Analysis of the Effect of Vasoactive Substances on the Blood Vessels in the Mesorchium of the Rat (16 mm. silent, black-and-white, 21 minutes) consists of cinemicrographic studies of blood-vessels and the cells running through them. The responses to adrenaline, 'Privine' (naphasoline nitrate), 'Priscol' (tolazoline hydrochloride), acetylcholine, and histamine are clearly demonstrated, and the increased permeability of the vessel in the presence of hyaluronidase is beautifully shown. Since the vessels are seen while the drug is being administered, not only is the dilatation or constriction plain but the rapidity and duration of the response are clear.

Lymph Vessel Movement Studies in the Mesentery of the Rat (16 mm. silent, black-and-white, 10 minutes) shows a lymph-vessel with its valve opening and closing between contractions of the vessel. Privine and adrenaline are shown to cause contraction of the vessel, whereas priscol relaxes it and the regular movements cease.

Each of these films is obtainable without charge from Ciba Laboratories Ltd.

AN ESCALATOR CHAIR

THE Hartmann Escalator Chair is a Danish invention which enables the disabled person to be taken up and down stairs by one attendant. It is driven by an electric motor

connected to the mains; this is geared to a rotating system of "star wheels" which climb the stairs, and the attendant guides the chair without effort. On the level, the chair is a comfortable wheel-chair.

A small number of these chairs are in use in this country and are said to be proving satisfactory. They are supplied by Messrs. Stanley Cox Ltd., 11, Gerrard Street, London, W.1, and the cost is £185.

A CANADIAN CENTENARY

THE March issue of the *Canadian Medical Association Journal* is devoted to the centenary of the faculty of medicine of Queen's University, Kingston, Ontario. The original articles and case-reports are written by the teaching staff; and the editorials include one contributed by the editor of the *Journal of the American Medical Association*, himself a graduate of Queen's. Deans of the eleven other medical faculties in Canada have sent their greetings.

When Queen's University was founded by Royal Charter in October, 1851, Kingston was hardly more than a British military outpost in Upper Canada. Now, the faculty of medicine provides facilities for medical training and research to some 400 students and postgraduates from Canada, the Commonwealth, and the U.S.A. Three other medical schools in Canada have been in existence for over a hundred years: these are McGill, Toronto, and Laval.

THE MEDICAL DIRECTORY

AFTER many years, the *Medical Directory*[1] has been rearranged, so that all the names are in a single alphabetical list. Now one needs to know only the name and not to search through all the artificial subdivisions "London," "Provinces," "Scotland," "Wales," "Ireland," "Abroad," and "Services" sometimes before tracking anybody down. The two volumes are labelled "A–L" and "M–Z, Universities, Hospitals, etc." ("etc." being local lists geographically arranged, schools of medicine, medical officers of health, and other details, including two "late lists," one of additional names and the other of changes of address. This is a great step forward, and there are several minor improvements of arrangement, but the dropping of the "numerical summary of the medical profession" and of the local lists "abroad" is surely a retrograde step.

A TELEVISION AID

Dr. Galpine has lately described in our columns (March 6, p. 518) a device enabling patients in respirators to see a television screen. In this connection the Dexray Engineering Company Ltd., 34, Ardwick Green South, Manchester, 13, inform us that they have lately marketed a device enabling viewers to watch the television screen from any position in a room, or several people to watch the screen from different places in the room. The appliance consists of a metal-coated optically ground glass reflector, fitted on an adjustable floor-stand. It is claimed that a patient with poliomyelitis has used this appliance successfully. The cost is £3 17*s.* 6*d.*

University of Cambridge

Prof. H. R. Dean, who has been master of Trinity Hall since 1929, will retire in June on reaching the statutory age-limit.

University of London

Dr. D. N. Baron, senior lecturer in clinical biochemistry at Middlesex Hospital Medical School, has been appointed to the university readership in chemical pathology at the Royal Free Hospital School of Medicine.

Dr. Baron, who graduated as M.B. Lond. in 1945, held a house-appointment at the Hospital of St. John and St. Elizabeth in London before becoming clinical pathologist at the R.A.F. Hospital at Nocton Hall. Before taking up his present post he was assistant in pathology at the Bland-Sutton Institute. His published work includes papers on the effect of cortisone on adrenal ascorbic acid depletion and on urinary pigments.

Dr. Eleanor Zaimis, lecturer in pharmacology at the School of Pharmacy, has been appointed to the university readership in pharmacology at the Royal Free Hospital School of Medicine.

Dr. D. P. Walther, L.D.S., senior hospital dental officer and orthodontist in charge of the orthodontic clinic at the Eastman Dental Hospital and senior hospital dental officer at the Hospital for Sick Children, Great Ormond Street, has been appointed to the university readership in orthodontics at the Royal Dental Hospital of London School of Dental Surgery.

London County Medical Society

A clinical meeting of this society will be held at St. James' Hospital, Sarsfeld Road, S.W.12, on Wednesday, April 7, at 2.30 P.M. Further particulars may be had from Dr. A. M. Ramsay, Royal Free Hospital, Lawn Road, N.W.3.

1. London: J. & A. Churchill. 1954. Pp. 2748. £3 12*s.*

University of Sheffield

Dr. D. H. Collins has been appointed to the chair of pathology in succession to Prof. H. N. Green, who has taken up the chair of experimental pathology in the University of Leeds.

Dr. Collins was educated at Rossall School and the University of Liverpool where he graduated as M.B. in 1930. After holding resident hospital posts at the Royal Southern Hospital, Liverpool, he was appointed Holt fellow in pathology in the University of Liverpool in 1931. The following year he became a junior lecturer in pathology in that university, and in 1933 he proceeded to the degree of M.D. In 1934 he was appointed the first rheumatism research fellow in the University of Leeds. During the late war he was seconded to the Emergency Pathological Service, and after establishing a base-hospital laboratory at Scotton Banks Sanatorium he was moved to Sheffield in 1940 as pathologist to Wharncliffe Emergency Hospital, later becoming medical superintendent of the hospital in charge both of its pathological services and its medical administration. For his services he was appointed O.B.E. In 1946 he returned to the University of Leeds as reader in clinical pathology, the post which he still holds. He is also an assistant editor of the *Journal of Pathology and Bacteriology*. His main research interests are centred on disease of the bone, and his book on the *Pathology of Articular and Spinal Diseases* appeared in 1949.

Dr. G. M. Wilson has been appointed to the chair of pharmacology and therapeutics, in succession to Prof. E. J. Wayne, who leaves Sheffield at the end of this month to take up the regius chair of practice of medicine in the University of Glasgow.

Dr. Wilson was educated at Edinburgh Academy and the University of Edinburgh. He graduated as M.B. with honours in 1940, when he was awarded the Ettles scholarship and Leslie gold medal. After holding house-appointments at Edinburgh Royal Infirmary he served in the R.A.F. from 1941 to 1946, becoming officer in charge of the medical division of No. 5 R.A.F. General Hospital at Cairo, and medical specialist to the R.A.F. Middle East Command medical board. In 1947 he was appointed an assistant to the medical unit of St. Mary's Hospital, London, and the same year he was awarded the F.R.C.P.E. and the degree of B.SC. with first-class honours in pathology. In 1950 he received the gold medal for his M.D. thesis and became lecturer in therapeutics in the University of Sheffield. Later he was appointed senior lecturer in therapeutics and a consultant physician to the United Sheffield Hospitals. In 1952 with an Eli Lilly travelling fellowship of the Medical Research Council he visited Harvard University. He has made a special study of disorders of the peripheral circulation, and more lately of the rôle of the endocrine system in the development of metabolic and cardiovascular disturbances.

University of Aberdeen

At the summer graduation in July the honorary degree of doctor of laws is to be conferred on Dr. Mary Esslemont.

Welsh National School of Medicine

Dr. W. W. Mushin has been appointed the first professor of anæsthetics in the University of Wales. The school has received covenants from some firms interested in anæsthetics and anæsthetic apparatus, guaranteeing for seven years annual grants of £700 to aid research in the department

Dr. Mushin, who qualified in 1932, received his medical training at the London Hospital. The following year he graduated as M.B. Lond. with honours. After holding house-appointments at the Royal National Throat, Nose, and Ear Hospital, London, and at the Seamen's Hospital, Greenwich, he became first assistant in the Nuffield department of anæsthetics at Oxford. In 1947 he was appointed director and lecturer in anæsthetics to the Welsh National Medical School at Cardiff, and he is also consultant anæsthetist and adviser in anæsthetics to the Welsh Regional Hospital Board. His publications include *Physics for the Anæsthetist* (1941), *Anæsthesia for the Poor Risk* (1949), and *Thoracic Anæsthesia* (1953).

Royal Society

The 25 newly elected fellows of this society include: Mr. A. Bradford Hill, D.SC., professor of medical statistics in the University of London at the London School of Hygiene and Tropical Medicine; Mr. H. W. Lissmann, assistant director of research, department of zoology, University of Cambridge; Mr. F. C. MacIntosh, PH.D., professor of physiology, McGill University, Montreal; Mr. L. H. Matthews, SC.D., director, Zoological Society of London; Mr. M. F. Perutz, PH.D., lecturer in biophysics, University of Cambridge; Mrs. Rosalind Pitt-Rivers, PH.D., biochemist, National Institute for Medical Research, London; Mr. J. W. S. Pringle, lecturer in zoology, University of Cambridge; Mr. Claude Rimington, D.SC., professor of chemical pathology, University College Hospital Medical School, London; Mr. Frederick Sanger, PH.D., biochemist, Medical Research Council, Cambridge.

Congress on Gerontology

The International Association of Gerontology are holding their third congress from July 19 to 23 in London. Mr. Iain Macleod, the Minister of Health, will open the meeting and Dr. J. H. Sheldon will deliver a presidential address. Subjects for discussion will include Critique of Surveys and Employment of the Elderly. Further particulars may be had from Mrs. Anne Humpage, R.R.C., the hon. organising secretary, B.M.A. House, Tavistock Square, W.C.1.

Medical Society for the Care of the Elderly

A meeting of this society will be held at Queen's Hospital, Croydon, on April 8, at 10 A.M. The speakers will include: Dr. A. D. Thomson, Dr. Francis Bach, and Dr. Trevor Howell.

Auxiliary Royal Army Medical Corps Funds

The annual general meeting of members will be held at 11, Chandos Street, London, W.1, on Monday, April 5, at 5 P.M.

Universities Federation for Animal Welfare

The federation is holding a congress at College Hall, Malet Street, London, W.C.1, from April 6 to 9. Further particulars may be had from Miss Williams, Branch Organiser, U.F.A.W., 284, Regent's Park Road, N.3.

World Health Day

The United Nations Association is holding a meeting to mark World Health Day on Wednesday, April 7, at 6.15 P.M., at the Royal College of Nursing, Cavendish Square, London, W.1. Dr. M. G. Candau, director-general of the World Health Organisation, and Mr. Walter Elliot, M.P., will speak.

In Memory of Sigmund Freud

At the meeting of the World Federation for Mental Health in Vienna last year it was suggested that a plaque should be placed on the house in Vienna where Freud lived and worked from 1891 to 1938. A plaque is accordingly to be unveiled at "Berggasse 19" on May 6, the anniversary of Freud's birth.

Electronic Red Blood-cell Counter

This instrument will be shown on the Department of Atomic Energy stand at the Physical Society exhibition on April 8–13.

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The proceedings of last year's conference in Liverpool organised by the Society for the Study of Fertility have been published for the society by Messrs. W. Heffer & Sons Ltd., Cambridge, at 10s.

CORRIGENDUM: *Royal College of Surgeons of England*.—The donors of the initial grant for the unit which is to investigate the physiology of wound healing (*Lancet*, Feb. 6, 1954, p. 320) are Messrs. Smith & Nephew Research Ltd.

Appointments

BOLTON, ANNE, M.B. Camb., M.R.C.P., D.P.M.: psdiatric psychiatrist (S.H.M.O.), Belgrave Hospital, London

CARRADO, A. R., M.D. Malta, T.D.D.: whole-time medical director, no. 2 mobile mass-radiography unit, Liverpool region.

GUNN, WILLIAM, M.B. Glasg., D.I.H.: chief M.O., North Thames Gas Board.

MATTHEWS, D. N., O.B.E., M.D., M.CHIR. Camb., F.R.C.S.: plastic surgeon, Royal Masonic Hospital London.

MINTO, W. H. P., M.B. Aberd., D.P.H.: deputy county M.O., Cumberland.

ROBERTS, G. W., M.B. Belf., D.P.H.: county M.O.H., Flintshire.

SEMPLE, ROBERT, M.D. Aberd., M.R.C.P.: asst. physician (consultant), unit of the professor of medicine, Maryfield Hospital, Dundee.

SOMERVILLE, WALTER, M.D. N.U.I., M.R.C.P.: asst. physician, department of cardiology, Middlesex Hospital, London.

STRACH, E. H., M.D. Prague, M.CH. ORTH. Lpool., F.R.C.S.: whole-time asst. orthopædic surgeon, Clatterbridge General Hospital.

WARD, G. W., M.B. Manc., D.P.H.: school M.O., Newquay area.

Appointed Factory Doctors:

ANDERSON, SAMUEL, M.B. Belf., D.P.H.: Sowerby Bridge, Yorks.
CANDLER, T. O., M.B. Camb., F.R.C.S.: Bideford, Devon.
FORSTER, J. F. P., M.R.C.S.: Porlock, Somerset.
GILLIES, J. D., M.B. Glasg.: Woking, Surrey.
HABGOOD, GEORGE, M.B. Camb., D.P.H.: Lyndhurst, Hants.
POSNER, RICHARD, M.D. Berlin, D.P.H.: Lenham, Kent.
UNWIN, PETER, M.C., M.B. Camb.: Newton Abbot, Devon.

Colonial Medical Service:

ARNEAD, J. D., M.B., D.C.P.: pathologist (grade B), Trinidad.
BOOLS, MARY M., M.B. N.U.I.: pathologist, Sierra Leone.
DAVID, J. B., M.B. Lpool, F.R.C.S.: E.N.T. specialist, Gold Coast.
FRANCIS, R. S.: M.O., Seychelles.
GABRYNOWICZ, J. W., M.B. N.U.I.: M.O., Nigeria.
GRAVE, G. F., M.B. Lond.: M.O., Falkland Islands.
HIBELL, A. J., M.B. Lond.: M.O., South Pacific Health Service.
LATHAM, J. E., M.B.: R.M.O. (Intern), Kenya.
LEACOCK A. G., M.B. Camb., F.R.C.S.: surgeon specialist, Barbados.
MONTGOMERY, T. H. L., M.B. Belf., D.P.H.: D.M.S., Western region, Nigeria.
SCHAERER, M. M.: M.O., Gold Coast.
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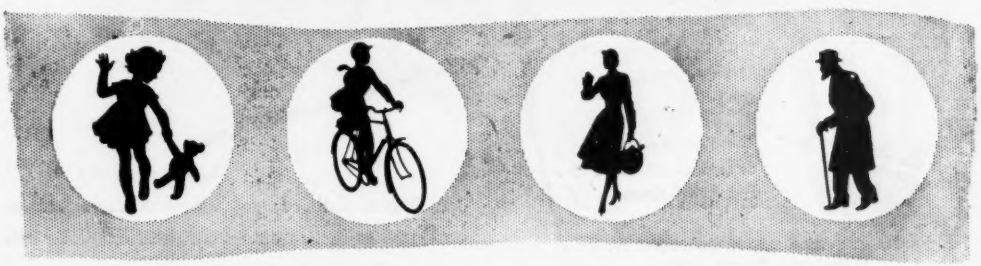

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Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

DERRICK MELVILLE DUNLOP, Esq., M.D., F.R.C.P., will deliver the LUMLEIAN LECTURES on TUESDAY, 6TH APRIL, and THURSDAY, 8TH APRIL, 1954, at 5 P.M. at the College, Pall Mall East.

Subject: "The Complications of Diabetes."

Any member of the medical profession admitted on presentation of card.

By order of the President.
HAROLD BOLDERO, Registrar.

UNIVERSITY OF OXFORD

WHITLEY PROFESSORSHIP OF BIOCHEMISTRY

Applications are invited (8 copies) for above Professorship and should reach the Registrar of the University by 29TH APRIL, 1954.

Stipend £2000 p.a. plus children's allowances. £300 p.a. as Head of department. Retiring age 67.

Further particulars available on application to the Registrar, University Registry, Oxford.

EMPIRE RHEUMATISM COUNCIL

Applications are invited for a TRAVELLING FELLOWSHIP tenable for up to 1 year, to prosecute research on some aspect of the Rheumatic Diseases. Medical or scientific qualifications are required. Salary according to qualifications and experience.

Applications, stating age, qualifications and experience, should be sent, with the names of 2 referees, to the General Secretary, Empire Rheumatism Council, Tavistock House (N), Tavistock-square, W.C.1.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 5TH JULY, 1954. The following Examination will be held in December, 1954.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE MEDICAL RESEARCH COUNCIL have a vacancy in their Radiotherapeutic Research Unit at Hammersmith Hospital for a RADIOTHERAPIST. Grading and salary according to qualifications and experience.

Applications to reach the Director, Radiotherapeutic Research Unit, Hammersmith Hospital, Ducane-road, London, W.12, by 9th April, 1954.

NUFFIELD INSTITUTE FOR MEDICAL RESEARCH, Woodstock-road, OXFORD. JUNIOR TECHNICIAN required to assist with Biochemical Research; minimum requirements General Certificate of Education, Chemistry and Biology.

Write, giving full details, to Secretary in first instance.

ST. MARY'S HOSPITAL MEDICAL SCHOOL (University of London), Paddington, W.2. Applications are invited for the appointment of Full-time ASSISTANT DIRECTOR of the Prediatric Unit for an initial period of 3 years. Salary within the scale £1250–£1750, together with superannuation under the F.S.S.U. and children's allowance. Candidates must be Fellows or Members of the Royal College of Physicians.

Further particulars should be obtained from the Secretary, St. Mary's Hospital Medical School, to whom applications in duplicate, together with the names of 3 referees, should be sent not later than 26th April, 1954.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN BACTERIOLOGY tenable at the London Hospital Medical College (salary within the range £1500–£2000 a year).

Applications (10 copies) must be received not later than 11th May, 1954, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF LEEDS. UNITED LEEDS HOSPITALS.—Applications are invited for the post of SENIOR REGISTRAR AND TUTOR IN PSYCHIATRY. The successful candidate will be a member of the University Department of Psychiatry and the duties will include work at the hospitals with which the University Department is associated and such other duties as may be assigned to him by the Head of the University Department.

Applications (3 copies), stating age, qualifications, and details of present and previous appointments with dates, and experience of teaching, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 19th April, 1954.

UNIVERSITY COLLEGE, Ibadan. Applications are invited for the CHAIR OF PHYSIOLOGY which becomes vacant at end of present session. Salary scale £2000–£100–£2500 p.a. for medically qualified applicants or at a fixed salary of £1950 p.a. for other applicants, plus £100 p.a. temporary increase pending outcome of present salary review. F.S.S.U. Family allowance £50 p.a. per child (maximum £150 p.a.) for children resident in Nigeria or £100 p.a. per child (maximum £300) for children resident elsewhere. Outfit allowance £60 on first appointment. Passages paid for members of staff and wife and assisted passages for children on appointment, termination, and annual leave in United Kingdom. Part-furnished residential accommodation at rent of not more than 7.7% of salary.

Applications (12 copies), naming 3 referees, to be received by 24th April, 1954, by the Secretary, Senate Committee for Higher Education in the Colonies, Senate House, London, W.C.1, from whom further information may be obtained.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a DEMONSTRATOR IN ANATOMY to begin duties on 1st October, 1954. Salary scale £600–£25–£650, with F.S.S.U. provision and family allowance. Initial salary according to qualifications and experience.

Applications (4 copies) should reach the Registrar (from whom further particulars should be obtained) by 8th May, 1954.

THE UNIVERSITY OF SHEFFIELD. Applications are invited for a post of SENIOR LECTURER or LECTURER IN ANATOMY, to begin duties on 1st October, 1954. Salary scales: Senior Lecturer, £1500–£100–£1800; Lecturer, £700–£100–£1500. Commencing salary in each grade according to qualifications and experience, with F.S.S.U. provision, and family allowance.

Applications (4 copies) should reach the Registrar (from whom further particulars should be obtained) not later than 8th May, 1954.

Hospital Services: Senior Appointments

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the post of CONSULTANT OBSTETRIC AND GYNÆCOLOGICAL SURGEON. The post is a part-time one for 3 sessions a week. Candidates must be Members or Fellows of the Royal College of Obstetricians and Gynæcologists and should be Fellows of the Royal College of Surgeons. The appointment is subject to the terms and conditions of service for hospital medical and dental staffs and to the National Health Service (Superannuation) Regulations, 1950–1952.

Applications (12 copies), giving details of age, qualifications, and experience, and with the names of 3 referees, should be sent to the undersigned not later than 17th April, 1954.

S. W. BARNES, House Governor.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT PHYSICIAN, The Mothers' Hospital (Salvation Army), E.5 (1 session a week); Thorpe Coombe Maternity Hospital, E.17 (1 session a fortnight). Special experience in cardiology desirable. Joint appointment.

Full or maximum Part-time CONSULTANT PHYSICIAN, Oldchurch Hospital, Romford, and St. George's Hospital, Hornchurch. Residence in the Group area is a requirement of the appointment.

Separate applications (6 copies), stating post concerned, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 10th April.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the appointment of Part-time CONSULTANT RADIOTHERAPIST in charge of the Department at the Hospital for up to 5 sessions a week.

Applications (10 copies), stating age, qualifications and experience, with names of 3 referees, to the Secretary not later than 8th May, 1954.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Part-time CONSULTANT ANÆSTHETIST (9 notional half-days weekly). Duties in General Surgery (3 notional half-days) in Birmingham (Dudley Road) Group and in Thoracic Surgery (6 notional half-days)—4 notional half-days at Yardley Green Hospital (413 Beds) and 2 notional half-days at Regional Thoracic Centre, Hill Top Hospital, Bromsgrove (76 Beds). Wide experience specialty and higher qualification or D.A. required.

Applications (15 copies), naming 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 12th April, 1954. Candidates may visit hospitals.

BIRMINGHAM. ST. MARGARET'S HOSPITAL. (1470 Beds.) Whole-time CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT. Wide experience specialty and D.P.M. required. Married quarters. New house to be built. All modern methods of rehabilitation of mental defectives practised.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, before 12th April, 1954.

LIVERPOOL REGIONAL HOSPITAL BOARD. Bootle GENERAL HOSPITAL. Applications are invited for the appointment of Part-time CONSULTANT ORTHOPÆDIC SURGEON, giving 2 sessions weekly, at the above Hospital. Applicants should possess a higher qualification in surgery.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 17th April, 1954.

VINCENT COLLINGE, Secretary to the Board.

LEEDS REGIONAL HOSPITAL BOARD. Locum Tenens ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) required immediately at Stanley Royd Hospital, Wakefield. Accommodation available. Remuneration 31½ guineas per week.

Applications, giving names and addresses of 2 referees, should be addressed to the Secretary, Leeds Regional Hospital Board, Park-parade, Harrogate.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST, in Adult Department, Hill End Hospital, St. Albans (767 Beds). Salary £1300 (at age 32)–£1750. Hospital may be visited by direct appointment.

Detailed applications, naming 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 4th May, 1954.

AMENDED ADVERTISEMENT

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade), Rush Green Hospital and other hospitals in the Romford, Essex, Group. The appointment covers all branches of pathology at this Hospital of 301 Beds. Residence in the Group area is a requirement of the appointment.

Applications (6 copies), detailing private address, date of birth, qualifications and experience, present appointment(s) (including number of sessions) and grade, and names of 3 referees, should reach the Secretary, 11A, Portland-place London, W.1, by Saturday, 10th April.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Whole-time CONSULTANT CHEST PHYSICIAN AND PHYSICIAN-SUPERINTENDENT of Baguley Hospital, near Manchester (400 Beds for pulmonary tuberculosis). The main Regional centre for the surgical treatment of pulmonary tuberculosis is at Baguley Hospital and there is also a new Chest Clinic adjacent to the Hospital serving the Wythenshawe area of which the Physician-Superintendent will have charge. Ample facilities for clinical research. A very good detached family house available in the grounds at reasonable rental. The Board would consider an application for maximum part-time service after 3 years. Membership of a Royal College of Physicians essential. 17th April, 1954.

(*b*) Whole-time NON-RESIDENT ASSISTANT RADIOTHERAPIST at Christie Hospital and Holt Radium Institute, Manchester. Candidates must possess the D.M.R.(T.). Successful candidate will be required to live in or near Manchester. Salary £1300–£50–£1750 p.a. 10th April, 1954.

(*c*) Part-time post (8 half-days weekly) of CONSULTANT OPHTHALMOLOGIST to Bolton and District Hospital Centre (special Ophthalmic Unit of 25 Beds at Bolton Royal Infirmary). Initially the successful candidate will be required to devote about 5 hours a week to the Bury General Hospital but later will devote himself entirely to Bolton. Wide experience and higher qualifications, such as F.R.C.S., desirable. 21st April, 1954.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by date stated.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Carlton Hayes Hospital, Narborough, near Leicester. A 5 bedroomed house is available. Salary £1300–£50–£1750.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 24th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ANÆSTHETIST required for the Rotherham and Mexborough Hospital Management Committee Group (Doncaster Gate Hospital (155 Beds); Moorgate Hospital, Rotherham (358 Beds); and Montagu Hospital, Mexborough (123 Beds)).

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th April, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum OPHTHALMOLOGIST required for 7 notional half-days weekly at the Leicester Royal Infirmary and associated School Clinics from 1st May for a minimum period of 3 months. Remuneration according to status.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment of Whole-time PSYCHIATRIST of Consultant status at Leybourne Grange Colony, West Malling, Kent. The selected candidate will be required also to act as Deputy Physician-Superintendent and, at the discretion of the Hospital Management Committee, do pastoral visits in other M.D. institutions in Kent and to undertake outpatient clinics. Salary will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates should possess a D.P.M. and preferably a higher qualification; mental deficiency experience is essential, and candidates should have had experience also in modern psychiatric therapeutic procedures, and occupational therapy. Detached house available on the Hospital estate.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 10th April, 1954. Applicants may visit Leybourne Grange Colony by arrangement with the Physician-Superintendent.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) at Brookwood Hospital, Knaphill, Woking, Surrey. Candidates should have D.P.M. Unfurnished flat in Hospital available, if required.

Applications (5 copies), giving date of birth, qualifications, experience, names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11a, Portland-place, W.1, by 20th April, 1954. Applicants may visit Hospital by local arrangement.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of DEPUTY MEDICAL SUPERINTENDENT to the Hortham-Brentry Group, Bristol (1359 Beds). The Deputy Medical Superintendent will be mainly concerned with the clinical work and administration of Brentry Hospital which contains approximately 420 Beds. The appointment will be on a whole-time basis in the Senior Hospital Medical Officer grade, and previous experience in mental deficiency is essential. The successful candidate, who will work under the general direction of the Medical Superintendent, will also be required to visit some of the ancillaries. Accommodation, suitable for a married man, is available at the Hospital.

Applications (12 copies), stating date of birth, qualifications and experience together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 20th April, 1954.

WEST CORNWALL CLINICAL AREA. South-Western REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the appointment of CONSULTANT RADIOLOGIST to the West Cornwall Clinical Area which comprises the districts of Truro, Bodmin, Newquay, St. Austell, Falmouth, Redruth and Penzance. The appointment may be held either on a whole-time or maximal (9 sessions) part-time basis. Applicants should have had wide experience in radiology, and possession of the Diploma in Medical Radiology is essential. The successful candidate will be required to work mainly at the Royal Cornwall Infirmary, Truro, and to undertake duties in other hospitals in the Clinical Area as may be determined by the Regional Board from time to time. Intending applicants and others are also invited to undertake the work on a locum basis until the permanent appointment is made.

Applications (12 copies), stating date of birth, qualifications and experience together with 12 copies of 2 testimonials, and the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 20th April, 1954.

WELSH REGIONAL HOSPITAL BOARD.

CONSULTANT ANÆSTHETIST to work mainly at the Caerphilly District Miners' Hospital, will be required to reside within the area, will also be expected to serve other hospitals in the Rhymney and Sirhowy Valleys and neighbouring Groups. Whole-time/maximum part-time appointment optional.

Whole-time PSYCHIATRIST (Senior Hospital Medical Officer), St. David's Hospital, Carmarthen (950 Beds—all modern methods of treatment—active outpatient clinics). House available.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

SOUTH AFRICAN BLOOD TRANSFUSION SERVICE. Applications are invited from suitably qualified persons for the position of DEPUTY MEDICAL DIRECTOR of the Service. In addition to being registered medical practitioners, applicants must have had serological and bacteriological experience. The appointment will be made on the salary scale £1700–£100–£2400 p.a., but cognisance may be taken of previous experience in determining the commencing salary of the successful applicant, who will be required to join the Service's Staff Provident Fund.

Applications, stating full details of age, qualifications, experience, marital status, &c., should be submitted in writing to the Medical Director, S.A. Blood Transfusion Service, P.O. Box 9326, Johannesburg, so as to be received not later than 1st May, 1954.

MELBOURNE. CANCER INSTITUTE BOARD, 483, Little Lonsdale-street, MELBOURNE, VICTORIA, AUSTRALIA. RADIOTHERAPIST. Applications are invited from suitably qualified medical practitioners for the position of Radiotherapist in either of the grades specified below.

(*a*) For the holders of the Diploma of Radiotherapy the commencing salary will be in the range of £1376 16s.–£1676 16s. p.a. according to experience. Annual increments of £75 p.a. within the range stated and thereafter at £100 p.a. rising to a maximum salary of £2176 16s. p.a.

Fellowship of the Faculty of Radiologists or Senior Degree or Diploma in Medicine or Surgery will entitle the holder to an additional commencing salary of £300 p.a.

(*b*) The salary range for Medical Officers holding senior qualifications plus the Diploma of Radiotherapy and deemed by the Board to be of Junior Consultant status is £2426 16s.–£2676 16s. p.a. These officers may apply for the right of limited private practice within the Institute subject to deduction from salary for each session so employed.

All salaries include £291 4s. p.a. current cost-of-living adjustment. Salary commences from date of embarkation. Fares by sea for appointee and family plus allowance for transport of personal effects will be paid. Superannuation equivalent to Federated Universities Scheme is available.

Applications, stating age, marital status, qualifications and dates of same, full details of experience and previous appointments, the names of 2 referees and approximate date of embarkation, close with the undersigned on 1st May, 1954.

A. F. CAMERON, Manager and Secretary.

Hospital Services : Junior Appointments

BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11. CASUALTY OFFICER/HOUSE SURGEON (resident). House Officer or Senior House Officer grade according to experience. Vacant mid-April.

Apply, enclosing copies of 2 recent testimonials, to Hospital Secretary (L).

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (General—313 Beds.) HOUSE SURGEON (gynæcology and obstetrics), pre-registration.

Applications, stating age, experience and qualifications, and copies of 2 recent testimonials, to the Hospital Secretary as soon as possible.

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of NON-RESIDENT HOUSE PHYSICIAN, for which there are 3 vacancies, for 6 months from 1st June. Duties include work in Outpatient Department and wards. Salary £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 10th April, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications invited for the post of SENIOR SURGICAL REGISTRAR (whole-time). The appointment is for 1 year commencing 1st June, 1954, with eligibility for reappointment. Candidates must hold the Diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 10th April, 1954, to KENNETH A. F. MILES, House Governor.

CHARING CROSS HOSPITAL GROUP. Applications are invited for the post of SURGICAL REGISTRAR (resident) tenable at Wembley Hospital for 1 year in the first instance from 1st June, 1954. Candidates should hold the Diploma of F.R.C.S. Salary and conditions in accordance with terms of service of hospital medical staff and subject to deduction for board-residence.

Applications, with copies of testimonials, should be sent to the undersigned by 24th April, 1954.

FRANK HART, Esq., D.P.A., F.H.A., Secretary to the Board.
Charing Cross Hospital, London, W.C.2.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER (Anæsthetist), whole-time, resident, for 6 months from 1st May, 1954, renewable. Previous experience in anæsthesia essential and possession of Part I of the D.A. an advantage. The Hospital is recognised for the Diploma.

Applications, with copies of testimonials or names of 2 referees, to Medical Director by 3rd April, 1954.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER in General Medicine required with duties mainly in the Geriatric Department. Good facilities for higher examination and insight into working of general practice. Whole-time appointment for 6 months in first instance. Post vacant 5th April, 1954.

Applications, with copies of 2 testimonials, to Medical Director by 3rd April, 1954.

EAST END MATERNITY HOSPITAL, 384/398, Commercial-road, London, E.1. (60 Beds. Post recognised for M.R.C.O.G.) RESIDENT OBSTETRICAL OFFICER required. 6 months House Officer III and, subject to satisfactory service, 6 months Senior House Officer. Whitley Council salaries; deduction for emoluments £100 and £156 respectively. Post vacant from 1st May, 1954.

Applications to Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

FULHAM HOSPITAL, St. Dunstan's-road, Hammersmith, W.6. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for appointment as REGISTRAR (anæsthetics), vacant immediately, at above Hospital. Post recognised for the F.F.A.R.C.S. examination. Candidates may visit the Hospital by arrangement with the Physician-Superintendent.

Applications (5 copies required to be completed) to be submitted immediately on forms obtainable from the Group Secretary (L.180), Fulham and Kensington Hospital Management Committee, 5, Collingham-gardens, London, S.W.5.

FRIERN HOSPITAL MANAGEMENT COMMITTEE, New Southgate, London, N.11. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary in accordance with the terms and conditions of service for hospital medical and dental staffs. Friern Hospital has 2470 Beds occupied by patients suffering from nervous and mental disorders and is readily accessible to Central London. All modern forms of treatment are carried out, active Occupational and other Therapeutic Departments.

Applications, giving age, qualifications, and details of experience, together with names and addresses of 2 referees, to the Physician-Superintendent by 6th April. Applicants may visit the Hospital by appointment.

FRIERN HOSPITAL, New Southgate, London, N.11. Vacancy for SENIOR HOUSE OFFICER (psychiatric). Salary £670 p.a., the appointment being in accordance with the terms and conditions of service for medical staff. The Hospital (2470 Beds) offers wide psychiatric experience dealing with voluntary, temporary and certified patients. All modern methods of physical treatment carried out.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should reach the Physician-Superintendent within 14 days from the appearance of this advertisement.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. Applications are invited for the post of MEDICAL REGISTRAR (Cardiac Department), which is graded Registrar, from those who have experience in angiocardiography and cardiac catheterisation. The appointment is for 1 year with eligibility for reappointment.

Applications, stating age and qualifications with dates, accompanied by copies of 3 testimonials, should be sent at once to THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. 2 vacancies occur 1st June, 1954, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 17th April.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HACKNEY HOSPITAL, London, E.9. (807 Beds.) Applications are invited for the 12 months (resident) appointment of SENIOR HOUSE OFFICER (obstetrics and gynæcology). The post is recognised for M.R.C.O.G., and previous experience in obstetrics and gynæcology is essential; a charge of £130 p.a. is made for residential amenities.

Applications to Group Secretary (with copy testimonials), Hackney Hospital, E.9, by 5th April, quoting reference HH/SHO.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the 6 months appointment of HOUSE PHYSICIAN, now vacant, should reach the Group Secretary at the above address by 31st March, quoting reference HH/HP.

HACKNEY HOSPITAL, London, E.9. (General—844 Beds.) Applications from registered medical practitioners for the posts of HOUSE OFFICERS (casualty) (1 with additional duties in the Skin Department and 1 with additional duties in the E.N.T. Department), should be sent as soon as possible to the Group Secretary at the above address.

HAMPSTEAD GENERAL HOSPITAL AND ELIZABETH GARRETT ANDERSON HOSPITAL. Applications are invited for the post of REGISTRAR to the E.N.T. Departments at the Hampstead General and Elizabeth Garrett Anderson Hospitals. Duties will commence on 1st May, 1954, or as soon afterwards as possible. Applicants should be registered medical practitioners of not more than 10 years standing.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 14th April, 1954.

KING EDWARD MEMORIAL HOSPITAL, Ealing, and CLAYPONDS HOSPITAL, SOUTH EALING. SOUTH WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required mainly for E.N.T. duties but with some general work at King Edward Memorial Hospital and Clayponds Hospital. Resident at Clayponds Hospital.

Apply in writing stating age, nationality, qualifications with dates, and previous experience, together with names of 2 referees, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 6th April, 1954.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. Applications invited for the post of RESIDENT HOUSE SURGEON, vacant 6th April, 1954. Tenable for 6 months, renewable. Salary £350, £400, or £450 p.a. according to experience, subject to deduction at the rate of £100 for board, lodging, &c. Available as pre-registration appointment.

Applications, with copies of testimonials, to the Secretary at the Hospital.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. Applications are invited for the appointment of Part-time REGISTRAR (grading Senior Registrar). The duties require the equivalent of 5 notional half-days a week, including 1 Refill Clinic. The appointment is for 1 year renewable.

Applications, stating age, qualifications with dates, and previous appointments held and accompanied by copies of 3 testimonials, should reach the undersigned not later than 10th April. THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st May, 1954, for RESIDENT SURGICAL OFFICER. Appointment for 6 months with prospect of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates, and previous appointments held, should reach the undersigned not later than 30th March, 1954.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Anæsthetics becoming vacant on 1st June, 1954. The appointment will be for 6 months in the first instance at a salary of £670 p.a.

Applications (6 copies), together with 6 copies of 3 recent testimonials, should be received by the House Governor by 14th April, 1954. H. BRIERLEY, House Governor.

MEMORIAL HOSPITAL, Woolwich, S.E.18. Senior HOUSE OFFICER (Casualty Department). Recognised for F.R.C.S. 6 months appointment and may be renewed for a further period. Salary £670 p.a., less £150 for residence.

Apply to Secretary.

MANOR HOUSF HOSPITAL, Golders Green, N.W.11 (exempted from National Health Service). Required, RESIDENT SURGICAL OFFICER (Male). Salary £700 p.a., less £100 p.a. deducted for emoluments. 6 months appointment, renewable.

Applications, stating age, nationality, qualifications, and surgical or orthopædic experience, with copies of 3 recent testimonials, to Mr. W. F. PENDRILL, Secretary.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

(1) SURGICAL REGISTRAR (resident), St. Margaret's Hospital, Epping. Post recognised for F.R.C.S. Experience in Orthopædics desirable.

(2) SURGICAL REGISTRAR (resident or non-resident), Oldchurch Hospital, Romford. 60 of 200 acute beds are in this section of general surgical unit. Post recognised for F.R.C.S.

(3) REGISTRAR in Obstetrics and Gynæcology (resident), North Middlesex Hospital and Annexes, Edmonton, N.18. Post recognised for M.R.C.O.G. 150 obstetric and 70 gynæcological beds.

(4) REGISTRAR in Obstetrics and Gynæcology (resident or non-resident), Bethnal Green Hospital, E.2.

(5) REGISTRAR in Obstetrics and Gynæcology (resident), Hackney Hospital and Mothers' (Salvation Army) Hospital. Post recognised for M.R.C.O.G. (Gynæcology).

(6) ANÆSTHETIC REGISTRAR (non-resident), Chelmsford and Essex and St. John's Hospitals, Chelmsford. Post recognised for D.A. Furnished flat available.

(7) ORTHOPÆDIC REGISTRAR (non-resident), West Ham Group of hospitals. Duties mainly at Queen Mary's Hospital for the East End and the East Ham Memorial Hospital.

(8) GERIATRIC REGISTRAR (resident), Langthorne Hospital, Leytonstone, E.11.

Appointments subject to review after 1 year.

Separate applications in duplicate, detailing date of birth, qualifications, experience, present appointment, grade and salary, with 2 copies of 2 recent testimonials, to Secretary, 11A, Portland-place, W.1, by 10th April, 1954.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant 12th April, 1954.

Applications with copies of testimonials to the Medical Director.

NATIONAL HEART HOSPITAL, Westmoreland-street, W.1 (with which is associated the Institute of Cardiology). The Board of Governors invites applications to fill a vacancy in the post of REGISTRAR as from 1st June, 1954. Applicants should have been fully trained in general medicine and should possess a higher medical qualification. Opportunities for research are available.

Applications, with copies of 3 recent testimonials, should be sent to me not later than Saturday, 10th April, 1954.

ROBERT G. E. WHITNEY, Secretary to the Board.

PUTNEY HOSPITAL, Lower Common, S.W.15. Casualty OFFICER AND E.N.T. HOUSE SURGEON (non-resident), House Officer grade, vacant immediately.

Apply at once, Hospital Secretary (L), enclosing copies of 3 recent testimonials.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. Applications are invited for the appointment of CASUALTY OFFICER AND DEPUTY RESIDENT SURGICAL OFFICER (Male or Female) (Senior House Officer grade) for 1 year commencing on 5th May, 1954. The post is recognised for the F.R.C.S.

Candidates should send applications, together with copies of 2 recent testimonials, to the Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 10th April, 1954.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). Appointments will be made for 2 consecutive periods of 6 months commencing 1st June, 1954. First period as House Physician and second as House Surgeon and Casualty Officer.

Application forms may be obtained from the Secretary at Hackney Road and should be returned with copies of not more than 3 testimonials, on or before 17th April, 1954.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. RESIDENT ANÆSTHETIST (Senior House Officer), resident, post tenable for 6 months from 1st July, 1954, in the first instance, for duties at both hospitals.

Applications to be sent to the Secretary to the Board of Governors by 12th April on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN. HOUSE SURGEON (Senior House Officer), resident post for 1 year from 1st August, 1954.

Applications to be sent to the Secretary to the Board of Governors by 12th April on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S AND CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL. JUNIOR OBSTETRIC OFFICER (Senior House Officer), resident post tenable for 6 months from 1st July, 1954.

Applications to the Secretary to the Board of Governors by 12th April on forms obtainable from 339, Goldhawk-road, London, W.6.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR GYNÆCOLOGICAL REGISTRAR to the Gynæcological and Obstetric Department. The post is full time and recognised under the Senior Registrar establishment. Duties to commence on 1st July, 1954. Candidates should be Members of the Royal College of Obstetricians and Gynæcologists.

Applications, together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 30th April, 1954.

STEPNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIANS (pre- or post-registration).

Mile End Hospital, vacant 3rd May.

St. George-in-the-East Hospital, vacant 28th April.

Application forms obtainable from Physician-Superintendent, Mile End Hospital, Bancroft-road, E.1, and Medical Superintendent, St. George-in-the-East Hospital, Raine-street, E.1.

ST. NICHOLAS HOSPITAL, Plumstead, London, S.E.18. CASUALTY OFFICER (recognised for F.R.C.S.), vacant early April. 6 months appointment. Salary £450 p.a., less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident REGISTRAR to the Department of Anæsthetics for 1 year in the first instance.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 5th April, 1954.

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. PÆDIATRIC HOUSE PHYSICIAN (resident). Post-registration.

Applications, naming 2 referees, to be sent to the Medical Superintendent immediately.

ST. JAMES' HOSPITAL, Ouseley-road, Balham, S.W.12. HOUSE PHYSICIAN (pædiatrics) required.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, 14, Atkins-road, Balham, S.W.12, by 3rd April.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T./Ophthalmology Departments) at the above Hospital.

Application forms from the Hospital Secretary, to be returned by 8th April, 1954.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). 2 posts vacant April at Memorial Hospital, Woolwich, and at St. Nicholas Hospital, Plumstead. Recognised for F.F.A.R.C.S. and D.A. 6 months appointments and may then be renewed. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments:—

SENIOR HOUSE OFFICER (pathology) for a busy and well-equipped laboratory at Stoke Mandeville Hospital, in which all branches of pathology for 1000 Beds are undertaken. Salary £670 p.a. Single accommodation will be available in the Medical Officers Quarters.

Applications, with copies of 2 testimonials, should be forwarded to the Administrative Officer, Stoke Mandeville Hospital, Aylesbury, as soon as possible.

Stoke Mandeville Hospital

SENIOR HOUSE OFFICER (dental) in the Department of Plastic Surgery and Jaw Injuries of Stoke Mandeville Hospital. Accommodation will be available in the Medical staff quarters.

HOUSE PHYSICIAN for the Pædiatric Department. The post qualifies for D.C.H. Duties will include care of children in Infectious Diseases Unit, Plastic Unit and Outpatients Department, Royal Buckinghamshire Hospital. Recognised pre-registration post, applications from registered practitioners will be considered. Post vacant from 16th April.

RESIDENT HOUSE PHYSICIAN for Medical Department, vacant 1st May. Recognised pre-registration post, applications from registered practitioners will be considered.

Applications for the above 3 posts, with copies of 2 recent testimonials, to the Administrative Officer.

Tindal General Hospital

HOUSE SURGEON (E.N.T.), Male or Female, vacant now. New department with high turnover and 4 outpatient clinics weekly. Recognised for D.L.O. and F.R.C.S. No casualty department.

Please apply, with 2 testimonials, to the Administrative Officer as soon as possible.

St. John's Hospital (Psychiatric), Stone, near Aylesbury, Bucks

JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident). Salary £700–£50–£1000 p.a., less a charge of £140 p.a. for board, lodging and laundry, if resident. Accommodation for married man available if required.

Applications, stating age, qualifications, and experience, together with the names of 3 referees, to the Physician-Superintendent within 2 weeks of the appearance of this advertisement.

ALTON GENERAL HOSPITAL. (117 Beds.) Winchester GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) with some experience of anæsthetics. Useful experience to be obtained in general medicine. The appointment is for 6 months in first instance. Vacant 18th April.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to Group Secretary, Royal Hampshire County Hospital, Winchester.

ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOSPITAL (Mental). (1350 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR (resident or non-resident) required at above Hospital. All forms of treatment carried out and outpatient clinics held at the local general hospitals. Facilities for research work and for attendance at D.P.M. and other courses in London. Hospital may be visited by direct appointment.

Applications forms obtainable from, and returnable to, Medical Superintendent, Three Counties Hospital, Arlesey, Beds, by 19th April, 1954.

ASHFORD HOSPITAL, Ashford, Kent. Applications are invited for the appointment of SENIOR HOUSE SURGEON at the above Hospital. Applicants should have held at least 3 hospital posts. The appointment will be tenable for a year. Salary £670 a year, less a deduction of £150 a year for residential emoluments.

Application, stating age, qualifications and the names and addresses of 2 referees, should be made to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Male) required at above Hospital for Traumatic and Orthopædic Unit. 6 months appointment, vacant 25th April, 1954. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for Special Departments (E.N.T., pædiatric, ophthalmology, &c.). 6 months appointment, vacant on 27th April, 1954.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital is recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER at the above Hospital.

Full particulars, stating age, qualifications, and experience, should be addressed to—

J. PRICE THOMAS, Secretary,
Mid-Wales Hospital Management Committee.
General Hospital, Aberystwyth.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from medical practitioners for post of HOUSE SURGEON at above Hospital. Post recognised for pre-registration purposes.

Applications, stating age, qualifications and experience, should be forwarded with 3 testimonials to—

J. LAWRENCE MEARS, Secretary
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ST. MARTIN'S HOSPITAL. Applications are invited from medical practitioners for post of HOUSE SURGEON (orthopædic) at above Hospital. Post recognised for pre-registration purposes.

Applications, stating age, qualifications and experience, should be forwarded with 3 testimonials to—

J. LAWRENCE MEARS, Secretary.
Bath Hospital Management Committee.
Manor Hospital, Bath.

BATH. ROYAL NATIONAL HOSPITAL FOR RHEUMATIC DISEASES. Applications invited from registered medical practitioners for post of HOUSE PHYSICIAN (Senior House Officer grade) at above Hospital, attached to which is the Rheumatism Research Unit of South Western and Oxford Regions. The Hospital is recognised for Part II of Diploma in Physical Medicine.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to—

J. LAWRENCE MEARS, Secretary.
Bath Hospital Management Committee.
Manor Hospital, Bath.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 110 Beds.) SENIOR HOUSE OFFICER required, who will advise pre-registration staff in their work, and whose duties will include responsibility for special departments. Post tenable for 1 year in the first instance. Salary £670 p.a. Furnished flat available for family if required.

Applications, including the names of 3 referees, to Group Secretary, 19, Alexandra-road, Barnstaple.

BEXHILL HOSPITAL, Bexhill, Sussex. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. House SURGEON required (recognised for pre-registration and by the Royal College of Surgeons for the F.R.C.S.) in Unit of General Surgery (approximately 85 Beds) under the control of 2 Consultant Surgeons. Vacant on 1st May, 1954.

Applications to the Secretary, enclosing copies of 2 recent testimonials.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE QUEEN ELIZABETH HOSPITAL. HOUSE SURGEON to E.N.T. Department required for period ending 6th July, 1954. Recognised pre-registration post but registered medical practitioners may apply.

Forms of application may be obtained from the undersigned.

G. A. PHALP,
Secretary and Principal Administrative Officer.
United Birmingham Hospitals.
Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer) in the Department of Bacteriology and Clinical Pathology. This officer will act as 1 of the 3 blood-bank Officers in addition to routine work in the department. Previous experience in clinical pathology is not essential but applicants should have had hospital postgraduate experience. The appointment will be for 12 months from 1st June, 1954. Further particulars can be obtained from the Director of Clinical Pathological Services.

Application forms may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him not later than 17th April, 1954.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE BIRMINGHAM AND MIDLAND HOSPITALS FOR WOMEN (incorporating the Hospital for Women and the Birmingham Maternity Hospital), Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited for the post of OBSTETRICAL AND GYNÆCOLOGICAL REGISTRAR, vacant on 1st July, 1954. The successful candidate will be required to alternate duty at the Hospital for Women and the Maternity Hospital, for specified periods. The post is recognised for the M.R.C.O.G., and applicants should have held house appointments and at least 1 obstetrical and gynæcological post.

Forms of application may be obtained from, and should be returned not later than 17th April, 1954, to, the House Governor at the above address.

G. A. PHALP, Secretary.
The United Birmingham Hospitals.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE SURGEON (resident) required.

Detailed applications, accompanied by 2 recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENT DEPARTMENT, George-road, BIRMINGHAM, 15. Required. SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience. Inpatient Department is modern and well equipped, providing facilities for study of skin diseases. Successful applicant will be required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to the Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILITATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) HOUSE SURGEONS (Male or Female). Posts vacant immediately, March and April. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country, and treats 50,000 new patients each year. Posts are open to registered practitioners and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. YARDLEY GREEN HOSPITAL—THORACIC SURGICAL UNIT. Applications are invited for the posts of 2 SENIOR HOUSE OFFICERS. The appointments will give broad opportunities for experience in both tuberculous and non-tuberculous thoracic surgery.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Secretary, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM. GROUP 25 BIRMINGHAM (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. Vacancy occurs for a SENIOR HOUSE OFFICER in Pathology in the main laboratory of this Group situated at Selly Oak Hospital. The post is a residential one and experience in hæmatology is an advantage but not essential. Salary in accordance with regulations.

Applications to the Pathologist, Selly Oak Hospital, Birmingham, 29.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1059 Beds.) Applications invited for the post of CASUALTY OFFICER (Senior House Officer), resident or non-resident. Recognised for F.R.C.S.

Applications, giving qualifications, experience and age with copies of 3 recent testimonials, to the Medical Superintendent.

BIRMINGHAM REGIONAL HOSPITAL BOARD. WOLVERHAMPTON GROUP NO. 16 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 posts as Part-time NON-RESIDENT CLINICAL ASSISTANTS to the Wolverhampton and Midland Counties Eye Infirmary for 3 sessions each per week. Possession of a Diploma in Ophthalmology will be an advantage. The persons appointed will work in association with the Consultants serving this Hospital. The duties of each post will consist mainly of attendance and assisting the Consultants at the outpatient clinics on 3 mornings per week. The appointments will be subject to the National Health Service superannuation regulations and in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) dated 7th June, 1949, as amended. Remuneration will be as in para. 10 (b) of the aforesaid document —i.e., £525 p.a. for 3 sessions per week.

Applications, together with the names of 3 referees, should be forwarded to W. COCKBURN, Group Secretary, Wolverhampton Group No. 16 Hospital Management Committee. The Royal Hospital, Wolverhampton. Canvassing of members of the Hospital Management Committee will lead to disqualification.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity.) Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (Midway between London and Cambridge. Main Line from Liverpool Street.) Applications are invited for the post of SENIOR HOUSE OFFICER (pathology) to commence 1st April, 1954, for 1 year. Salary £670, less £130 p.a. in respect of residential emoluments.

Applications, stating qualifications, nationality, age and experience, with copies of recent testimonials or the names of 2 referees, should be sent to the Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (386 occupied beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of a Whole-time Temporary SURGICAL REGISTRAR at the above Hospital. Appointment to commence as soon as possible. Salary at the rate of £775–£890 p.a., less £130 p.a. for residential emoluments.

Applications, giving fullest details, together with copies of recent testimonials or the names of referees, to the Administrative Officer.

BLACKBURN. ROYAL INFIRMARY. (262 acute beds.) SENIOR HOUSE SURGEON required to take up duty mid-April. This post is recognised for F.R.C.S. and offers the holder ample opportunity to practice general surgery under the control of 3 Consultant Surgeons, over 100 Beds being allocated to this specialty.

Apply to Secretary of Committee, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following HOUSE SURGEON posts :—

Queen's Park Hospital, Blackburn (644 general including 234 acute beds).

Royal Infirmary, Blackburn (262 acute beds).

Victoria Hospital, Accrington (112 acute beds).

Approved for pre-registration purposes. Recognised for F.R.C.S.

Apply to the Secretary of Committee, Royal Infirmary, Blackburn.

SENIOR HOUSE OFFICER (orthopædics and casualty) required. Post recognised for F.R.C.S. and offers wide experience in this specialty in the Outpatient and Casualty Departments and wards of Blackburn Royal Infirmary.

Apply to the Secretary of Committee, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.) BLACKPOOL AND FYLDE HOSPITAL MANAGEMENT COMMITTEE. ASSISTANT RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 6th May, 1954. Salary £670 p.a. Recognised for the F.R.C.S. Diploma. The post offers excellent experience in emergency and general surgery. Appointment for 12 months. The evening duties alternate with those of the Resident Surgical Officer.

Applications, with testimonials or the names of 2 referees, to be sent to the Hospital Secretary, Victoria Hospital, Blackpool.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH, CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of MEDICAL REGISTRAR at the above Hospital of 290 Beds (including 60 acute medical, chest and chronic sick beds). Applicants must be registered medical practitioners, and the possession of a higher qualification will be considered an advantage. The post is now vacant, and is tenable for 1 year in the first instance. Duties will include outpatient work at the Royal Victoria Hospital, Bournemouth.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

RESIDENT ANÆSTHETIST (Senior House Officer grade). Main duties at Bolton District General Hospital and Bolton Royal Infirmary. Tenable for 12 months and recognised for the D.A.

The Royal Infirmary, Bolton (237 Beds)

RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Tenable for 12 months and recognised for F.R.C.S.

SENIOR HOUSE OFFICER in Surgery (resident or non-resident) for duties in Casualty Department. Tenable for 12 months and recognised for F.R.C.S. Suitable appointment for practitioner requiring time for study for higher qualification. Basic duties 9 A.M.–5 P.M.

Applications, stating age, nationality, qualifications and experience, and the names of 2 referees, should be sent immediately to H. P. TRAVIS, Group Secretary.

The Royal Infirmary, Bolton.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. SENIOR HOUSE OFFICER for duties in the E.N.T. Department (78 Beds) of the Group Hospitals. Vacant end of March. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with the names and addresses of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) HOUSE SURGEON required at the above Hospital, vacant 1st April. Recognised for D.O. Successful applicant will be considered for senior post (Senior House Officer) on completion of 6 months.

Applications stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer.

BRECHIN, ANGUS. STRACATHRO HOSPITAL. (650 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Medical Unit of the above Hospital. The Unit consists of 120 Beds, including pediatrics.

Applications, stating age, qualifications, experience and enclosing 2 recent testimonials or naming 2 referees, should be addressed to the Medical Superintendent, Stracathro Hospital, Brechin, within 14 days of the appearance of this advertisement.

BRADFORD ROYAL INFIRMARY.

HOUSE SURGEON (general and urology), vacant now. Recognised for F.R.C.S. and pre-registration purposes.

HOUSE OFFICER (anæsthetics), vacant 1st May. Recognised for D.A. and F.F.A.R.C.S. Opportunities for plastic and intra-thoracic experience.

Salary for either of above posts £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, experience, qualifications, and nationality, with copy testimonials, to Secretary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 1st April. Recognised for D.O.M.S. and F.R.C.S. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. Senior House OFFICER (general medicine and clinical pathology), vacant 1st May. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol. Applications are invited for the post of JUNIOR HOUSE OFFICER to work in the Infectious Diseases Section (346 Beds).

Apply Resident Physician, Ham Green Hospital, Pill, near Bristol.

BRISTOL CLINICAL AREA. The Board of Governors of THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Diseases of the Chest, for duties at the Bristol Chest Clinic and associated hospitals. Good training in general medicine is essential and previous experience in diseases of the chest desirable. The appointment will be held for 1 year in the first instance, and be renewable for a further year. Candidates can visit the Chest Clinic by appointment.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 12th April, 1954.

BRISTOL. COSSHAM / FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. HOUSE SURGEON (Thoracic Surgery Department). House Surgeon required in the above department, which is the regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications with full particulars should be addressed to the Group Secretary, Frenchay Hospital, Bristol, quoting "Thoracic."

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. SENIOR HOUSE OFFICER (surgical), resident or non-resident, at the above Hospital. Salary and conditions of service in accordance with national rules.

Applications should be made to—

H. WILKINSON, Esq., Group Secretary.

Bury General Hospital, Bury, Lancs.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) Applications are invited for the post of HOUSE SURGEON (obstetric and some general and gynæcological duties). Designated for Pre-registration Service. The Hospital is recognised for the F.R.C.S.

Applications, with full details, naming 2 referees, should be sent to the Secretary.

COVENTRY GROUP 20 HOSPITAL MANAGEMENT COMMITTEE invite applications for the following posts :—

Gulson Hospital, Coventry (312 Beds)

HOUSE OFFICER in General Medicine, vacant 1st May. 77 medical beds.

George Eliot Hospital, Nuneaton (296 Beds)

HOUSE OFFICER in General Medicine, vacant 1st May. 50 medical beds. Recognised for pre-registration.

Manor Hospital, Nuneaton (139 Beds)

HOUSE OFFICER in General Medicine, vacant 6th May. 29 medical beds. Recognised for pre-registration.

Coventry and Warwickshire Hospital

JUNIOR HOSPITAL MEDICAL OFFICER (ophthalmology), vacant now. (36 Beds.) Very large Outpatient Department, including optical dispensing. Recognised D.O. Previous experience desirable.

Applications to the Secretary, No. 20 Group Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. (346 Beds.) REGISTRAR (resident) in General Medicine. Experience specialty desirable.

Applications to Group Secretary, Coventry and Warwickshire Hospital, Stoney Stanton-road, Coventry, by 12th April. Candidates may visit Hospital.

COLCHESTER. ESSEX COUNTY HOSPITAL. (189 Beds.) Applications invited for post of SENIOR HOUSE OFFICER to Casualty and Radiotherapy Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts :—

Black Notley Hospital, Braintree, Essex (544 Beds)

SENIOR HOUSE OFFICER to Pulmonary Tuberculosis Unit (198 Beds). Post tenable for 1 year.

HOUSE OFFICER (orthopædic surgery). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S. Salary as scale, plus £50.

Locum REGISTRAR in Surgery. Salary £16 a week, less £150 a year if resident.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

CROYDON GROUP HOSPITAL MANAGEMENT COM-MITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for appointment of REGISTRAR in Pathology in the Croydon Group Laboratories. Training in all branches of hospital pathology.

Application forms obtainable from Group Secretary, Hospital Management Committee, General Hospital, Croydon, returnable within 14 days.

CROYDON, SURREY. MAYDAY HOSPITAL. (619 Beds.) RESIDENT SENIOR GYNÆCOLOGICAL AND OBSTETRICAL HOUSE OFFICER required for a period of 6 months in the first instance commencing 23rd April, 1954.

Forms of application obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned by 5th April, 1954.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER to the Obstetric and Gynæcological Department (105 obstetric and 30 gynæcological beds), vacant early June. Post recognised for M.R.C.O.G.

Applications, stating age, qualifications, and experience, with copies of recent testimonials and the names and addresses of referees, should be sent to the Group Secretary, St. Helier Hospital, by 7th April.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration, first, second, or third post). The above post, which is recognised for the F.R.C.S., becomes vacant early May, 1954. National Health Service salary and conditions.

Applications, together with copies of 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (276 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which is now vacant. Salary £670 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital.

CARDIFF. ST. DAVID'S HOSPITAL. (656 Beds.) Cardiff HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (non-resident) required in Casualty Department, to commence 1st May, 1954.

Application form immediately from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF ISOLATION HOSPITAL. Cardiff Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required at above Hospital.

Apply immediately to Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF (near). PRINCE OF WALES ORTHOPÆDIC HOSPITAL, RHYDLAFAR. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. 2 SENIOR HOUSE OFFICERS required for above Hospital.

Form of application immediately from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CHICHESTER (near). ALDINGBOURNE SANATORIUM (71 Beds) AND BOGNOR REGIS ANNEXE (49 Beds). HOUSE PHYSICIAN (Male or Female) required immediately for work in wards and Outpatient Clinics. Liaison with Thoracic Unit, Chichester. Resident at Bognor Regis.

Apply to Physician-Superintendent, Aldingbourne Sanatorium, near Chichester.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). (430 Beds.) Required, SENIOR HOUSE OFFICER (Orthopædic Department). Previous orthopædic experience not essential. Appointment very suitable for candidate reading for a higher grade qualification and is recognised for the F.R.C.S.

Applications, together with names and addresses of referees, to Physician-Superintendent, as soon as possible.

CHESTER-LE-STREET. GENERAL HOSPITAL. (207 Beds.) DURHAM HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER in General Surgery. Applications are also invited for the post of HOUSE SURGEON (general surgery) for a period of 6 months. This post is recognised as a pre-registration appointment. Both these appointments are vacant now.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, should be sent to the Group Secretary, Dryburn Hospital, Durham, as soon as possible.

CHESTERFIELD ROYAL HOSPITAL. Resident Casualty OFFICER (pre-registration grade or Senior House Officer if person appointed has sufficient experience) required at above Hospital, 18th April, 1954. Ministry of Health salary and conditions. The Casualty Department includes 2 Junior and 1 Senior Casualty Officers, and the post is recognised for F.R.C.S. training. Duties are primarily in the Casualty Department, but by mutual arrangement 1 Casualty Officer performs duties in the Accident and Orthopædic Department, so that opportunities occur for all 3 officers to gain experience in that specialty.

Apply in detail, with copies of recent testimonials, to—
M. H. BOONE, Secretary,
Chesterfield Hospital Management Committee.

CHEAM, SURREY. ST. ANTHONY'S HOSPITAL. Applications are invited for the post of RESIDENT HOUSE OFFICER (with surgical duties) which will become vacant in early April, 1954.

Applications, with testimonials, to be sent to the Medical Superintendent.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. Resident HOUSE SURGEON (pre-registration), vacant immediately.

Applications, with copies of 2 recent testimonials, should be sent to Secretary at the Infirmary.

DERBY. DERWENT HOSPITAL. (187 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (chest and infectious diseases) required. A Consultant Thoracic Surgeon attends this Hospital each week. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DERBY (near). PASTURES HOSPITAL, Mickleover, near DERBY. (1465 Beds. Recognised for training for D.P.M.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (psychiatry) required. Appointment for 1 year in first instance. A house is available.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DEWSBURY HOSPITAL MANAGEMENT COMMITTEE NO. 11. Applications are invited for the position of SENIOR HOUSE OFFICER in Dermatology for work in the Dewsbury, Wakefield and Pontefract Groups, which will become vacant on 30th April, 1954. The position can be resident or non-resident as required. Salary and conditions of service are in accordance with national recommendations, and the post is subject to the National Health Service and Superannuation Acts.

Applications, giving full particulars of qualifications, experience, and previous posts, together with the names of 3 referees, should be addressed to the undersigned immediately.

GEO. W. BATCHELOR, Group Secretary.
20, Oxford-road, Dewsbury.

DEWSBURY. STAINCLIFFE GENERAL HOSPITAL. (314 Beds.) HOUSE OFFICER (general surgery), first, second, or third post, vacant 1st May, 1954, and tenable for 6 months. Recognised pre-registration appointment. The Hospital has a Surgical Unit of 66 Beds and is recognised for the F.R.C.S. Casualty duty is shared with 3 other House Officers.

Applications, with full particulars to the Administrative Officer at the Hospital.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant at the end of March, 1954, offers varied experience in pleasant surroundings. 4 residents on the staff, salary at the rate of £350, £400, or £450 a year, according to experience. A deduction of £100 a year made in respect of residential emoluments. Duties may include acting in the medical wards or casualty. Appointment for 6 months in first instance.

Applications, stating full details, with copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DURHAM HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (general surgery) required immediately at the General Hospital, Chester-le-Street, County Durham (207 Beds).

Applications, with full particulars and the names and addresses of 2 referees, to the Group Secretary, Dryburn Hospital, Durham.

DURHAM. COUNTY HOSPITAL. (120 Beds.) Durham HOSPITAL MANAGEMENT COMMITTEE. ORTHOPÆDIC AND CASUALTY HOUSE SURGEON required immediately for 6 months. Post recognised for pre-registration purposes.

Applications, giving full particulars and names of 2 referees, to Group Secretary, Durham Hospital Management Committee, Dryburn Hospital, Durham, as early as possible.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners for following appointments :—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (resident), surgical. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Corbett Hospital, Stourbridge (106 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (resident), surgical. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Prestwood Sanatorium (200 Beds)

SENIOR HOUSE OFFICER (resident). Post now vacant. Salary £670 p.a., less £150 p.a. for residential emoluments.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. Locum RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital for 2 weeks commencing 10th April, 1954. Salary at the rate of £670 p.a. Deduction for board and lodging at the rate of £130 p.a.

Apply immediately to Medical Director.

EDGWARE GENERAL HOSPITAL. (715 Beds.) Resident SENIOR HOUSE OFFICER in Pathology required at above Hospital, vacant 5th May, 1954. Salary £670 p.a. Deduction of £130 p.a. for board lodging, &c.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 10th April, 1954.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER required at above Hospital. Candidates should have held resident appointments in general hospitals and have had special experience in administering anæsthetics. Salary £670 p.a. Deduction of £130 p.a. for board, lodging, &c. Appointment for 6 months in first instance. Post vacant 13th April, 1954.

Applications, together with names of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 3rd April, 1954.

EDINBURGH CENTRAL HOSPITALS. Applications are invited from registered medical practitioners for the appointment of ANÆSTHETIST (Senior House Officer grade) in above Group. National Health Service salary scale and conditions of service. Non-resident. Work, mainly with children, will include some adult general surgery and gynæcology.

Applications, with full details of experience, qualifications and age, and names of 2 referees, to be submitted immediately to the Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments :—

Cumberland Infirmary, Carlisle (340 Beds)

1 HOUSE OFFICER (" Specials "—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

ENFIELD WAR MEMORIAL HOSPITAL, Chase-side, ENFIELD, MIDDLESEX. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required for general medical and surgical duties in this acute General Hospital of 61 Beds. 12 months appointment.

Applications, with the names and addresses of 2 referees, to the Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Immediate vacancy. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, immediately.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the post of HOUSE SURGEON, vacant 13th April, 1954. The post is also open to pre-registration candidates.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary, by 3rd April, 1954.

EXETER CLINICAL AREA. The Board of Governors of THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in General Surgery. The appointment will be held for 1 year in the first instance, and be renewable for a further year. During the first year, the successful candidate will work mainly at the Torbay Hospital, Torquay, and at Newton Abbot Hospital, but may be required to undertake sessions in other hospitals in the Group as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 12th April, 1954.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) RESIDENT HOUSE SURGEON. Post is vacant on 1st May, is tenable for 6 months and recognised for F.R.C.S. examination and for pre-registration applicants.

Apply as soon as possible, with copies of 3 testimonials, to Hospital Secretary.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. 2 HOUSE SURGEONS (Male or Female) required. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. Both are pre-registration posts. Salary £350, £400, or £450 according to experience, less £100 for residence. Alternatively, as Senior House Officer posts, salary £670, less £150 for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, with names of 2 referees, to Hospital Secretary.

GRIFFITHSTOWN, MONMOUTHSHIRE. COUNTY HOSPITAL. 251 Beds. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required 1st April. Post recognised for D.Obst. R.C.O.G. Modern Maternity Unit of 32 Beds. Salary £670, less £130 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport.

GRIMSBY MATERNITY HOSPITAL. (51 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR OBSTETRIC HOUSE OFFICER (resident) required urgently.

Apply immediately to Secretary, 3, Queens-parade, Grimsby.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER for Orthopædic, Fracture and Accident Service. Previous surgical and orthopædic experience would be an advantage. Locum would be considered.

Applications should be sent immediately to the Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (orthopædics) required. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HALIFAX AREA HOSPITALS MANAGEMENT COM-MITTEE. JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics required for duty at Halifax General Hospital (425 Beds) and Royal Halifax Infirmary (301 Beds). Residence at Halifax General Hospital. Post now vacant.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX GENERAL HOSPITAL. (425 Beds.) House PHYSICIAN (general medicine) required. Post vacant 1st May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON (E.N.T. and ophthalmology) required. Post vacant 2nd May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE PHYSICIAN (general medicine) required. Post vacant 2nd May. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Post vacant 4th April. Salary £670 p.a., with deduction of £130 p.a. for residence &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) HOUSE SURGEON required. Post vacant 26th March. Approved pre-registration appointment.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery required. Duties include work in the Casualty Department. Post recognised for F.R.C.S. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required, vacant now, resident. Male or Female. National scale of salary.

Apply to Hospital Administrator.

HASTINGS GROUP HOSPITAL MANAGEMENT COM-MITTEE. Locum ORTHOPÆDIC REGISTRAR required. Week-to-week basis as from 1st May, 1954. Salary £16 per week.

Apply Group Secretary, 11, Holmesdale-gardens, Hastings (Phone : Hastings 5400).

HENLEY-ON-THAMES. PEPPARD CHEST HOSPITAL. (244 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident), vacant immediately. Surgical experience an advantage, as post provides opportunity for work in Thoracic Surgery Unit. Salary and conditions of service as recommended by Ministry of Health. Deduction for residence, &c., £150 p.a. Further particulars available from Physician-Superintendent at Hospital.

Applications, stating age, nationality, qualifications with dates, present post, with copies of recent testimonials, to Group Secretary, 3, Craven-road, Reading.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required 1st May, 1954, for 1 year in the first instance, at the above Hospitals. The Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds, by 12th April, 1954.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Applications are invited for the post of RESIDENT HOUSE SURGEON at the Lister Hospital, vacant 21st April, 1954. Recognised as a pre-registration post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Director, Lister Hospital, Hitchin, Herts.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Locum RESIDENT SURGICAL REGISTRAR required immediately. Salary £16 per week, less charge for residence at the rate of £140 p.a.

Apply to Hospital Secretary. (Telephone : HOUnslow 4448.)

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) RESIDENT SURGICAL REGISTRAR required for 1 year in the first instance. Post now vacant. Recognised for F.R.C.S. Candidates may visit the Hospital by direct appointment with the Hospital Secretary.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, London-road, Ashford, Middlesex, by 7th April, 1954.

HORNCHURCH, ESSEX. ST. GEORGE'S HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required at this Hospital which accommodates 339 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for 2 HOUSE SURGEON posts, which are now vacant. 6 monthly term in each case. Both count toward D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, to be sent to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. South WEST MIDDLESEX HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER required in Anæsthetics. Post recognised by the Faculty of Anæsthetists.

Applications, stating age, nationality, qualifications, with copies of up to 3 recent testimonials, to Group Secretary, West Middlesex Hospital, Isleworth, Middlesex, by 6th April, 1954.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in General Medicine. The post offers a good opportunity for working for higher qualifications and there are approximately 70 acute medical beds.

Applications, stating age, nationality, together with copies of recent testimonials, should reach the Hospital Secretary by 3rd April, 1954.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon, vacant on 1st May, 1954. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IRVINE. AYRSHIRE CENTRAL HOSPITAL. Infectious DISEASES SECTION. (202 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident appointment), vacant 1st May, 1954. Offers a wide variety of experience in modern methods of diagnosis and treatment of infectious diseases.

Apply immediately to Area Medical Superintendent, 1, Hill-street, Kilmarnock.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (112 Beds.) HOUSE SURGEON (not pre-registration) required at the above Hospital. Post fell vacant on 28th January, 1954.

Applications, with the names of 3 referees, to the Hospital Secretary.

LINCOLN. COUNTY HOSPITAL. (200 Beds.) Applications are invited for an approved Registration post in Surgery at the above Hospital.

Apply with full particulars to—

R. W. HOWICK, Group Secretary.

LIVERPOOL, 6. NEWSHAM GENERAL HOSPITAL. A vacancy exists for either a whole-time appointment or shorter term locum tenens for the post of HOUSE SURGEON. Candidates may be registered or pre-registration medical practitioners, Male or Female, resident or non-resident. Duties are concerned mainly with orthopædic cases and with a small but increasing number of general surgical patients. There are 2 active orthopædic wards containing 70 Beds, and a large Physiotherapy Department. Rehabilitation forms a large proportion of the work and the vacancy would be suitable for those interested in physical medicine or studying for the D.Phys.Med., though previous orthopædic experience is not essential. Salary will be £350–£450 p.a. according to experience, less £100 p.a. if resident. Remuneration for a locum tenens would be £8 per week.

Applications or inquiries to the Physician-Superintendent at the Hospital.

LIVERPOOL, 6. NEWSHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners (Male or Female) for appointment as JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (resident or non-resident), depending on the qualifications and experience of the successful applicant. General duties in acute and chronic medical wards. Salary £700–£50–£1000 p.a. or £670 p.a., in each case less £130 p.a. if the applicant appointed is resident.

Applications or inquiries to the Physician-Superintendent at the Hospital.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE SURGEON (E.N.T. and ophthalmology).

Applications as soon as possible to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP. Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications as soon as possible to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of HOUSE PHYSICIAN. Recognised as pre-registration post. Vacant 5th April, 1954. The appointment will be for 6 months in the first instance.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 30th March, 1954.

LUTON AND DUNSTABLE HOSPITAL, Luton, Beds. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer), vacant 20th April, 1954. The post offers varied experience and is recognised for the D.A. examination.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 12th April, 1954.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (plastic surgery), now vacant. The appointment is recognised as a pre-registration house post but applications will be accepted from practitioners registered before 1st January, 1953.

Applications, with copy of 1 testimonial and the names of 2 referees, should be forwarded to the Administrative Medical Officer, St. James's Hospital, Leeds, 9, as soon as possible.

LEEDS, 2. PUBLIC DISPENSARY AND HOSPITAL. LEEDS A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of CASUALTY OFFICER (Senior House Officer) at the above Dispensary. The appointment will be for a period of 1 year. Salary in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, with an appropriate deduction in respect of board, lodging, &c.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

Chest Diseases

Duties at The Hospital, Middleton-in-Wharfedale (350 T.B. beds) (residential accommodation available for single applicant).

General Surgery

(*a*) Clayton Hospital, Wakefield (75 general surgical beds). Duties are those of Resident Surgical Officer. (Recognised for F.R.C.S.)

(*b*) Keighley and District Victoria Hospital (55 general surgical beds) (preferably resident).

Genito-urinary Surgery

(Appointment jointly with Board of Governors.) The Outpatient and Diagnostic Department and 20 Beds are at the Leeds General Infirmary, and 40 Beds are at St. James's Hospital, Leeds.

Infectious Diseases

Duties at the Castle Hill Hospital, Cottingham, E. Yorks. (208 I.D. beds) (resident).

Obstetrics and Gynæcology

Duties in the York A Group (present beds—44 obstetric and 55 gynæcological). In the near future a new hospital with 97 obstetric and 75 gynæcology beds is being opened in this Group which will replace the existing facilities. Application for recognition by the R.C.O.G. has been made.

Orthopædic Surgery

(*a*) St. James's Hospital, Leeds (64 orthopædic beds), and the Public Dispensary, Leeds (non-resident).

(*b*) Hull A Group (50 orthopædic beds). Hull B Group and East Riding Group (50 orthopædic beds) (non-resident). Includes some duties in the Casualty Department at the Hull Royal Infirmary.

(*c*) Huddersfield Royal Infirmary and other hospitals in the Huddersfield Group (34 orthopædic beds) (non-resident).

(*d*) The General Hospital, Batley (36 orthopædic beds), and other hospitals in the Dewsbury, Batley and Mirfield Group (resident).

Pædiatrics

The Victoria Hospital for Sick Children, Hull (150 Beds), and other general hospitals with pædiatric beds in the Hull A and the East Riding Hospital Management Committee Groups (non-resident).

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 2nd April, 1954.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following SENIOR REGISTRAR posts :—

Anæsthetics

Duties mainly in the Hull A Group of Hospitals with additional duties as required in the Hull B and East Riding Groups (non-resident).

Psychiatry

(*a*) Duties at Meanwood Park Colony, Leeds, and as a Trainee Specialist in Child Psychiatry. Residential accommodation is available at Meanwood Park for a single person. The duties will be allocated to allow 5 sessions in the University of Leeds Department of Psychiatry (Children's Section) which is associated with the Leeds General Infirmary. Candidates must hold the D.P.M. or equivalent qualification.

(*b*) De la Pole Hospital, Willerby, Hull (1000 Beds). This Hospital has a high admission-rate and a separate Neurosis Unit for females. A self-contained flat will be available in the Hospital. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualification.

Radiology

Duties at hospitals in the Halifax and Huddersfield Groups. Subject to satisfactory progress the successful candidate may be given an opportunity of undertaking a period of advanced training at the General Infirmary, Leeds.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 16th April, 1954.

LYMINGTON HOSPITAL, Lymington, Hampshire. (95 Beds.) RESIDENT SENIOR HOUSE OFFICER (medical) required from 1st May, 1954.

Applications, with copies of testimonials, to be submitted as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

MAIDSTONE. MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the Kent County Ophthalmic and Aural Hospital, and the West Kent General Hospital, Maidstone (total beds 248). The post, which is vacant now, is of Senior House Officer grade, and carries a salary of £670 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant immediately. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MANSFIELD AND DISTRICT GENERAL HOSPITAL. (205 Beds. Recognised training hospital for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (orthopædics) required with duties in the Casualty Department. The successful candidate will also be required to undertake services at the Crow Hill Rehabilitation Centre, Debdale Hall, and other hospitals in the Group. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

MIDDLESBROUGH. WEST LANE ISOLATION HOS-PITAL. (224 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER. Salary £670 p.a., conditions of service being in accordance with the Ministry of Health regulations. The post offers facilities for experience in all branches of infectious diseases, pulmonary tuberculosis and acute pædiatrics.

Applications, with copies of 2 recent testimonials, should be forwarded to the Physician-Superintendent, West Lane Hospital, Middlesbrough, as early as possible.

L. BRITTAIN, Secretary,
Cleveland Hospital Management Committee.

MANCHESTER, 19. THE DUCHESS OF YORK HOS-PITAL FOR BABIES. MANCHESTER BABIES' AND CHILDREN'S HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE PHYSICIAN (Male or Female) for 6 months. The Hospital is associated with Manchester University for teaching purposes.

Applications, with copies of 3 testimonials, to be sent to the Administrative Officer of the Hospital as soon as possible.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the vacant post of SENIOR HOUSE OFFICER (orthopædic).

Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded to the undersigned immediately. A. H. KEATES, Secretary to the Committee.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to a General Medical Unit, to commence on 23rd July, 1954. Whole-time, non-resident post, tenable for 6 months, renewable for a second and possibly a third 6 months.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 24th April, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Hæmatology, to commence as soon as possible. Whole-time appointment for 12 months, renewable. The post is mainly clinical in character, involving ward and general outpatient clinic duties. Higher qualifications would be an advantage but are not essential.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 7th April, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR MEDICAL REGISTRAR, to commence as soon as possible in the University Department of Cardiology and to transfer after a period of 18 months to 2 years to a General Medical Unit at the Manchester Royal Infirmary or at one of the Manchester Regional Hospitals. Whole-time non-resident post, tenable for 12 months, renewable. Applicants must possess higher qualifications.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 7th April, 1954.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. REGISTRAR to the Department of Psychiatry, to commence 1st July, 1954. Applicants must have held house appointments and should possess a higher qualification. Previous experience in psychiatry essential. Whole-time appointment for 12 months, renewable.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 14th April, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to the Department of Psychiatry, to commence on 1st July, 1954. Whole-time non-resident post, tenable for 6 months, renewable for a second and possibly a third 6 months. Experience in general medicine is essential. This is a first training post and candidates, if they do not already possess the D.P.M., are expected to read for the D.P.M.(Manchester).

Applications to be made on forms obtainable from the undersigned and to be returned not later than 14th April, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—426 Beds)

1 SENIOR HOUSE OFFICER (Anæsthetics). Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 SENIOR HOUSE OFFICER (pædiatrics). Hospital recognised for training for Diploma in Child Health. Vacant 1st May, 1954.

1 SENIOR HOUSE OFFICER (obstetrics and gynæcology). Post recognised for training for Membership and Diploma in Obstetrics examination of the R.C.O.G. Vacant 20th May, 1954.

2 HOUSE OFFICERS (general surgery) (pre- or post-registration). Posts recognised for F.R.C.S. examination. Posts now vacant.

1 HOUSE OFFICER (F.N.T.) (pre- or post-registration). Post now vacant.

Eccles and Patricroft Hospital

1 SENIOR HOUSE OFFICER, vacant mid-April, 1954.

1 HOUSE OFFICER (post-registration post). Additional allowance of £50 p.a. Post now vacant.

The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Royal MANCHESTER CHILDREN'S HOSPITAL. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Registrar grade), falling vacant 1st June, 1954. Previous experience in pædiatrics essential and higher qualifications desirable. The Hospital is the chief teaching unit of the University Department of Child Health.

Applications, stating age, nationality and experience, together with names of 3 referees, to be forwarded to the Group Secretary, Salford Royal Hospital, Chapel-street, Salford, 3, to be received not later than Monday, 12th April, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD. Wigan AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR in Radiodiagnosis required for duties mainly at the Royal Albert Edward Infirmary, Wigan (resident or non-resident). Post now vacant. Applicants should preferably hold the D.M.R.(D.).

Applications, giving the names of 2 referees, should be sent to the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in General Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool (344 Beds). The post which is vacant on 1st July, 1954, is recognised under the F.R.C.S. regulations. The appointment offers excellent opportunity of practical experience in general and emergency surgery to suitably qualified candidates.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of SENIOR REGISTRAR in Diagnostic Radiology to the North Manchester Group of hospitals (Ancoats, Manchester Northern, and Manchester Victoria Memorial Jewish Hospitals). Arrangements may later be made for person appointed to transfer to the United Manchester Hospitals to continue training.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 12th April, 1954.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Pathology. The duties will be with the Stockport and Buxton Hospital Management Committee and the successful candidate will work under the direction of the Consultant Group Pathologist.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to be addressed to the undersigned, forthwith. H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of NON-RESIDENT REGISTRAR in Chest Diseases. The main duties will be with the Stockport and Buxton Hospital Management Committee, and the successful candidate will work under the direction of the Consultant Chest Physician. The post offers scope for experience in both tuberculous and non-tuberculous diseases of the chest, and in hospital, sanatorium and clinic practice.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to be addressed to the undersigned, immediately. H. G. PRICE, Group Secretary.

59B, Shaw-heath, Stockport, Cheshire.

NEWCASTLE REGIONAL HOSPITAL BOARD. Durham HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR (whole-time), resident or non-resident, at Dryburn Hospital (319 Beds). Salary £775–£890 p.a. Appointment for 1 year in the first instance, and may be renewed for a further year.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 7 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Sunder-LAND AREA HOSPITAL MANAGEMENT COMMITTEE. Locum REGISTRAR ORTHOPÆDIC SURGEON (whole-time), for the Sunderland Orthopædic and Accident Hospital for approximately 3 months. Salary £16 per week.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, immediately.

NEWCASTLE REGIONAL HOSPITAL BOARD. Regional THORACIC SERVICE. REGISTRAR THORACIC SURGEONS (2) required for duties at the Regional Centre (160 Beds) at Shotley Bridge General Hospital, where the work is almost entirely non-tuberculous (cardiovascular, œsophageal and pulmonary) and at the associated sanatoria. The appointments are intended for trainees in thoracic surgery. Applicants should have completed training in general surgery and desire to obtain basic experience in thoracic surgery before finally deciding to take up a career in thoracic surgery. A higher surgical qualification is necessary, and some experience in chest surgery will be an advantage. Salary scale £775–£890 p.a., and the appointment will be for 1 year in the first instance, and may be renewed for a further period.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA FOR CUMBERLAND AND NORTH WESTMORLAND. EAST CUMBERLAND GROUP OF HOSPITALS. REGISTRAR ANÆSTHETIST (whole-time) required immediately for 1 year in the first instance, with probable extension for a further period. Accommodation can be provided for a single person at the Cumberland Infirmary, Carlisle, where the main duties of the post will lie.

Applications, with names of 1–3 referees, to be sent to the Senior Administrative Medical Officer, 1, Lonsdale-street, Carlisle, within 14 days.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER or SENIOR HOUSE SURGEON (orthopædics). Joint appointment now vacant at Newcastle General Hospital (861 Beds) and the W. J. Sanderson Orthopædic Hospital School for Children (121 Beds). Duties mainly at the latter hospital where resident accommodation is available.

Applications, with copies of 2 recent testimonials, should be sent to the Group Secretary, Newcastle upon Tyne Hospital Management Committee, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Neurosurgical Department). The above post may be either resident or non-resident. The appointment is tenable for 12 months in the first instance.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials by 10th April, 1954.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF OBSTETRICS. The resident post of OBSTETRICAL HOUSE SURGEON (70 Beds) becomes vacant on 1st May, 1954. This post is recognised for the purpose of Pre-registration Service, and preference will be given to provisionally registered persons who have served 6 months in a medical or surgical post since qualification. The department is recognised for the Diploma of M.R.C.O.G., and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials by 15th April, 1954.

NEWMARKET GENERAL HOSPITAL. East Anglian REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Post now vacant. Appointment for 1 year, renewable for second year.

Detailed applications, including age, and the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 12th April, 1954. Candidates are invited to visit the Hospital by direct arrangement with the Hospital Management Committee Secretary at the Hospital.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications are invited for the post of HOUSE SURGEON, which is immediately vacant. Duties include surgical house charge of general surgical, E.N.T., and eye cases. The post is resident and available for 6 months and is recognised for pre-registration.

Applications, with copies of 3 recent testimonials, should be addressed to the Physician-Superintendent.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Reqnired, SENIOR HOUSE OFFICER for the above Hospital. Duties to commence on or about 23rd April, 1954. Salary £670 p.a., less a deduction of £150 for residential emoluments. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds. Recognised for the D.C.H.) Applications are invited for the following posts which fall vacant at the beginning of May. The posts are tenable for 6 months or a year by agreement :—

RESIDENT HOUSE SURGEON (post recognised for pre-registration).

RESIDENT SENIOR HOUSE OFFICER (surgical).

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident HOUSE SURGEON required (Male or Female, also open to pre-registration candidates) at the above Hospital ; duties to commence as soon as possible. Salary and conditions of service in accordance with published regulations. The appointment is for a term of 6 months.

Applications, stating age, qualifications, and experience, to be sent to HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER (resident or non-resident by arrangement). The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments. Locum considered.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department (48 obstetrical beds, 11 gynæcological beds and a small block for puerperal pyrexia). The appointment is for a period of 12 months commencing about mid-May. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Salary and conditions of service in accordance with the Ministry regulations.

Applications, stating age, qualifications and experience also nationality, with copies of 3 recent testimonials, to be sent to—

General Hospital, Nottingham. HENRY M. STANLEY.

NORWICH. UNITED NORWICH HOSPITALS. East ANGLIAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Duties at Norfolk and Norwich Hospital, West Norwich Hospital, and Jenny Lind Children's Hospital. Post recognised for D.A. and provides wide experience. Single quarters available. Post now vacant.

Detailed applications, including age and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th April, 1954. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary at Norfolk and Norwich Hospital.

NORTHALLERTON. FRIARAGE HOSPITAL. (General —337 Beds.) NORTHALLERTON HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (Physician), pre-registration post, required at the above Hospital. National salary and conditions.

Applications to be made to the Group Secretary, Friarage Hospital, Northallerton, Yorkshire.

NORTHAMPTON GENERAL HOSPITAL. (485 Beds.) Immediate vacancies for the following :—

2 HOUSE OFFICERS (general surgery).

1 FRACTURE AND ORTHOPÆDIC HOUSE OFFICER.

All posts recognised for F.R.C.S., and for pre-registration. 6 months appointments in first instance. Deduction £100 a year for residential emoluments.

Applications, enclosing copies of 3 testimonials, as soon as possible to S. G. HILL, Superintendent.

NORTHAMPTON. ST. ANDREW'S HOSPITAL (for Nervous and Mental Disorders). Applications are invited from registered medical practitioners for the appointment of Locum Tenens MEDICAL OFFICER during holiday season. Previous psychiatric experience not necessary. Salary 16 guineas per week, plus residential emoluments.

Applications to be addressed to the Medical Superintendent.

NORTH GLOUCESTERSHIRE CLINICAL AREA. The BOARD OF GOVERNORS OF THE UNITED BRISTOL HOSPITALS AND THE SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited by the above Boards from registered medical practitioners for the joint appointment of REGISTRAR in Orthopædic and Traumatic Surgery to the Orthopædic Service in the North Gloucestershire Clinical Area. The appointment will be held for 1 year in the first instance, and be renewable for a further year. The successful candidate will be required to work for the first year mainly at the Gloucestershire Royal Hospital, Gloucester, but may be required to undertake sessions in other hospitals in the area as circumstances require.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 12th April, 1954.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for post of SENIOR HOUSE PHYSICIAN to Geriatric Unit (Cowley Road Hospital) for 3 months with effect from 1st May, 1954. Salary at rate of £670 p.a.

Applications, stating age, experience and qualifications, together with names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, by 9th April, 1954.

OXFORD REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in General Medicine to the Northampton General and Associated Hospitals. The post will be held for 1 year and be eligible for extension to a second year. Single accommodation available.

Applications on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 7th April.

PONTEFRACT. GENERAL INFIRMARY. Pontefract AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE (YORKS). RESIDENT SURGICAL OFFICER required. Graded Senior House Officer. Salary £670. 1-year appointment. Recognised for Fellowship. Offers good scope for practical experience. Vacant. Married accommodation available if required.

Applications to Secretary, Gt. Northern House, Salter-row, Pontefract, Yorks.

PONTYPOOL AND DISTRICT HOSPITAL, Pontypool, MONMOUTHSHIRE. (115 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (surgical) required immediately. This is the senior resident post, and resident staff consists of 2 House Surgeons, a House Physician and this post. This is a busy acute general hospital with a good Outpatient Department and regular visits from Consultants. Post offers good practical experience in surgery. Salary £700–£50–£1000, less £150 board-residence.

Write, quoting names of 2 referees, to—

T. A. JONES, Group Secretary.

64, Cardiff-road, Newport, Mon.

PETERBOROUGH. THE MEMORIAL HOSPITAL, AND OBSTETRIC ANNEXES. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON (obstetrics and gynæcology). There are 54 obstetric beds and a busy Gynæcological Department. The Unit consists of a Consultant, Registrar, and 2 House Surgeons. House Surgeon posts are recognised for D.Obst.R.C.O.G. Vacant 16th May, 1954.

Apply Secretary, Memorial Hospital, Peterborough.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of SENIOR HOUSE OFFICER (orthopædic), vacant now. Salary £670 p.a. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE SURGEON in Obstetrics and Gynæcology, 14th May, 1954, recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Wide experience can be obtained in obstetrics, including antenatal and postnatal clinics.

(2) SENIOR HOUSE OFFICER in Surgery, Freedom Fields, March, 1954. The Hospital is recognised for the Fellowship of the Royal College of Surgeons.

(3) HOUSE SURGEONS, Greenbank Road, immediately and 20th April, 1954, recognised for the Fellowship of the Royal College of Surgeons.

(4) HOUSE SURGEON, Devonport, 18th May, 1954.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE PHYSICIAN required with duties mainly in the geriatric and acute medical wards at St. Mary's Hospital, Portsmouth.

Applications, giving qualifications and experience, should be sent to the Group Secretary, 35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of ANÆSTHETIC REGISTRAR in the Portsmouth Group, main duties at Saint Mary's Hospital: This post offers a wide range of experience in most branches of surgery, including thoracic, ophthalmic, E.N.T., and midwifery. Recognised by the Faculty of Anæsthetists.

Forms of application may be obtained from the Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 9th April, 1954. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Secretary of the Group.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital

SENIOR HOUSE PHYSICIAN, vacant now. The duties will be mainly in medical wards that form an Admission Unit for 450 geriatric beds in the Group, a Consultant Physician being in charge of this Unit. In addition, the successful candidate will act as Registrar to 20 acute medical beds in the Hospital.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant now.

Queen Alexandra Hospital

(124 surgical beds). Recognised for F.R.C.S.

SENIOR HOUSE SURGEON, vacant now.

Infectious Diseases Hospital (310 Beds—Fever and T.B.)

SENIOR HOUSE OFFICER, vacant now.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required for duties in the Casualties and Admission Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER in Pathology required in this large general hospital containing well-equipped laboratory where excellent opportunities exist for gaining extensive experience.

Applications to be sent to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) HOUSE SURGEON (resident) required from 1st May, 1954, in the Obstetric and Gynæcological Unit consisting of 96 obstetric beds and 52 gynæcological beds. Post is approved for pre-registration purposes and recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

SCUNTHORPE AND DISTRICT WAR MEMORIAL HOSPITAL. (269 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (pre-registration), vacant 19th April.

Applications to Hospital Secretary at above address.

REDHILL COUNTY HOSPITAL, Earlswood Common, REDHILL, SURREY. (519 staffed beds.) REDHILL GROUP HOSPITAL MANAGEMENT COMMITTEE. SURGICAL REGISTRAR (193 surgical beds). Married quarters available. Hospital situated 20 miles south of London.

Application forms and appointment to visit from Group Secretary at the above address.

SALISBURY GENERAL HOSPITAL. South West Metro-POLITAN REGIONAL HOSPITAL BOARD. SALISBURY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of MEDICAL REGISTRAR at above Hospital with effect from 15th September, 1954.

Further details and application forms obtainable from, and should be returned to, Group Secretary, Odstock Hospital, Salisbury, within 14 days of the appearance of this advertisement.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER to the E.N.T. Department. The Department is recognised for D.L.O. and F.R.C.S. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SCARBOROUGH HOSPITAL. (190 Beds.) Required, SENIOR HOUSE OFFICER (surgical) to commence duty towards the end of April. Terms and conditions of service in accordance with those prescribed for medical and dental staffs. The post will be for a period of 6 months (it is recognised by the Royal College of Surgeons for the F.R.C.S. for that period) or for any longer period which may be mutually agreed. The position is non-resident but there is a flat available near the Hospital, if required.

Applications, giving age, qualifications, details of present and previous appointments, and the names of 2 referees, should be forwarded to the Hospital Secretary.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Medical Paediatrics at the Royal Hospital for Sick Children, Edinburgh. The post is superannuable, and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of REGISTRAR in Medicine at the Eastern General Hospital, Edinburgh. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for 2 appointments as REGISTRAR in Medicine at the Royal Infirmary of Edinburgh. The posts are superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of REGISTRAR in Surgery at the Royal Infirmary of Edinburgh. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of REGISTRAR in E.N.T. Surgery at the Royal Infirmary of Edinburgh. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOS-PITAL BOARD. Applications are invited for the post of REGISTRAR in Medicine at Bangour Hospital, Broxburn, West Lothian. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in E.N.T. Surgery at the Edinburgh Northern Group of hospitals. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of SENIOR REGISTRAR in Paediatrics. The post is non-resident and the main duties are at Raigmore Hospital and the Royal Northern Infirmary, Inverness. Previous experience in paediatrics is essential and experience in general medicine would be an advantage.

Forms of application and further particulars of the post are obtainable from the undersigned, to whom applications should be submitted by 5th April, 1954.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. RED CROSS SANATORIA OF SCOTLAND. (156 Beds.) Applications are invited for the post of ASSISTANT MEDICAL OFFICER, for which there are 2 vacancies. 1 of these vacancies will be of Registrar status while the second will be of Senior House Officer grade. Terms and conditions of service will be in accordance with the existing national scale. A Thoracic Surgical Unit is situated at the Sanatoria and a large number of major surgical cases are dealt with annually. These posts offer valuable training in the selection of cases for major surgery, and in their preoperative and postoperative management.

Apply, giving full particulars of qualifications and experience, together with the names of 2 referees, to the Medical Director, Tor-na-Dee, Milltimber, Aberdeenshire, within 10 days of the appearance of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRAR for the Hand Service, Derbyshire Royal Infirmary, required for 1 year in the first instance. Senior Registrars who are completing their normal tenure of 4 years or who are in their fifth or subsequent year are eligible for the appointment.

Applications to be sent to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 12th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, and naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Resident Locum REGISTRAR (chest and infectious diseases) required from 1st April at the Derwent Hospital, Derby. Remuneration at the rate of £16 per week with deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Locum REGISTRAR (orthopædics) required from 14th April (approximately) at the Mansfield and District General Hospital. Remuneration at the rate of £16 per week with a deduction if resident.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRARS in Psychiatry required for Bracebridge Heath Hospital, near Lincoln; The Pastures Hospital, Mickleover, near Derby; and The Towers Hospital, Humberstone, near Leicester. Posts non-resident at Bracebridge Heath Hospital and The Towers Hospital; a house available at the Pastures Hospital. Appointments for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details of posts obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 17th April, 1954.

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds. Recognised for D.Path.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (pathology) required, with duties at other hospitals in the Sheffield area. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 5th April, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible, to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required immediately. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time MEDICAL REGISTRAR becoming vacant on 24th June, 1954. Post will be tenable for 1 year in the first instance. Candidates may, by prior arrangement, visit the Hospital if they so desire.

Forms of application will be forwarded on request, by the undersigned, to whom they should be returned by not later than 10th April, 1954.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SLOUGH, BUCKS. UPTON HOSPITAL. Senior House OFFICER (casualty) required. Post vacant 17th April. Salary on national scale.

Applications, stating age and qualifications, together with testimonials, should be sent to Hospital Secretary.

SLOUGH, BUCKS. UPTON HOSPITAL. Locum Senior HOUSE OFFICER (casualty) required. Post vacant 17th April. Salary on national scale.

Applications, together with testimonials, should be sent to Hospital Secretary.

SLOUGH. UPTON HOSPITAL. Locum Anæsthetic REGISTRAR required 1st April.

Applications, stating details of experience, to Hospital Secretary.

SLOUGH. UPTON HOSPITAL. Anæsthetic Registrar (resident) required at above Hospital. Post recognised for D.A. Approximately 60% of duties performed at Upton Hospital and 40% shared between other hospitals in the Group. Hospital may be visited by direct appointment.

Application form obtainable from and returnable to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th April.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following posts:—

Tynemouth Victoria Jubilee Infirmary (109 Beds)
SENIOR HOUSE SURGEON.
HOUSE SURGEONS (2).

Preston Hospital (331 Beds)
HOUSE SURGEON.

House Surgeon posts recognised for Pre-registration Service and, subject to certain conditions, for F.R.C.S. purposes.

Applications should be sent to the Group Secretary, Preston Hospital, North Shields, Northumberland.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. (Joint appointment with the United Bristol Hospitals.) Applications are invited by the above Board from registered dental practitioners for the joint appointment of REGISTRAR in Dental Surgery. The successful candidate will be appointed to work for 1 year in the first instance in the Maxillo-Facial Unit at Frenchay Hospital and in the University of Bristol Dental Hospital. He may also be required to perform duties in other hospitals in the Teaching Hospital Group.

Applications, stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 12th April, 1954.

ST. HELENS. ECCLESTON HALL HOSPITAL. (75 Beds.) ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. The person appointed will work under the supervision of the Consultant Chest Physician for the Group. There are 75 Beds and the work comprises all types of tuberculosis. Good residential accommodation for a single person, Male or Female, is available.

Applications to be forwarded to N. RICHARDS, Secretary,
Group Office, Whiston Hospital, Prescot.

STORNOWAY. LEWIS HOSPITAL. Lewis and Harris HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN at the above Hospital, which falls vacant on 1st April, 1954. Salary £400–£500 p.a. according to previous experience. Preference will be given to applicants with previous hospital service. The post is superannuable and will be for a period of 6 months in the first instance.

Applications, together with copies of recent testimonials, should be sent immediately to—

IAN MACLEOD, Secretary and Finance Officer.
Lewis Hospital, Stornoway.

STOKE-ON-TRENT. BUCKNALL ISOLATION HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the post of SENIOR HOUSE OFFICER (medical) vacant shortly.

Applications, with copy testimonials and full details, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.).

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE OFFICER (gynæcology and obstetrics, mainly surgery). Recognised for M.R.C.O.G. (gynæcology).

Applications, giving full details, together with copy testimonials, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (475 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for post of SENIOR HOUSE OFFICER (ophthalmics). Recognised for F.R.C.S. and D.O.

Applications, stating age, and experience, together with copy testimonials, to the Group Secretary at Head Office, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for HOUSE OFFICER (general surgery), vacant now. Hospital recognised for F.R.C.S. examinations, and the post is recognised for experience during the pre-registration period.

Apply, with copy testimonials, stating age, nationality, and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of SENIOR HOUSE OFFICER (surgical). 2 posts are available if no applicants are forthcoming for pre-registration appointments. The posts are recognised for F.R.C.S. examination.

Applications, giving details of previous appointments held together with copies of recent testimonials, should be forwarded forthwith to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of HOUSE OFFICER (general surgery) pre-registration. 3 posts. Vacant shortly.

Applications, with copy testimonials, to be forwarded to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (obstetrics and gynæcology) required. 2 posts vacant shortly. Pre-registration appointments. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Detailed applications to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, with copy testimonials as soon as possible.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of :—

SENIOR HOUSE OFFICER (orthopædics) to the above Group. The post is non-resident.

2 SENIOR HOUSE OFFICERS (anæsthetics). 1 post will be held at Stockport Infirmary, and the other at Stepping Hill Hospital, Stockport, and they may be either resident or non-resident. Both posts are recognised for the D.A. and F.F.A.R.C.S. and there are facilities for study.

Stockport Infirmary, Stockport

HOUSE OFFICER (general surgery and ophthalmology). The post is approved for pre-registration purposes and recognised for the F.R.C.S. and D.O.M.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, 59B, Shaw-heath, Stockport, Cheshire, immediately.

ST. ALBANS. "HIGH WICK," Tyttenhanger, St. Albans, HERTS. MID HERTS GROUP HOSPITAL MANAGEMENT COMMITTEE. General Practitioner required for 1 session per week at the above centre for psychotic and grossly maladjusted children to have the care of the physical well-being of children and staff. Candidates should be interested in child welfare and live within reasonable travelling distance of the centre.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, by 5th April, 1954.

SUNDERLAND AREA HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST (Male or Female) to undertake duties at hospitals within the above Group. Grading of the post will be as Senior House Officer. Salary £670 p.a., less £120 in respect of residence which will be provided at the Orthopædic and Accident Hospital, Sunderland. The post offers exceptional experience for the D.A. with Consultant Anæsthetists and, being near a Teaching School, very good opportunities to attend lectures.

Apply to the Group Secretary, Sunderland Area Hospital Management Committee, General Hospital, Sunderland, naming 2 referees.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident post of SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital. The Hospital is recognised under the regulations of the F.R.C.S. (E.N.T.) and the D.L.O.

Applications, stating age, qualifications and experience, should be forwarded to O. C. HOWELLS, Group Secretary.

St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (recognised for Pre-registration Service) at the above Hospital.

Applications, with full particulars, should be sent to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. RESIDENT MEDICAL REGISTRAR required at above Hospital which may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 11th April.

TREDEGAR GENERAL HOSPITAL. (20 miles from Newport and 24 from Teaching Hospital at Cardiff ; 6 miles from the Vale of Usk, Surgical Unit of 50 Beds, with also 6 orthopædic beds, under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient and Casualty Departments.)

SENIOR HOUSE OFFICER (surgery).

HOUSE SURGEON (pre-registration if suitable candidate available).

Senior House Officer post tenable 12 months ; salary £670, less agreed deduction for full residential emoluments. House Officer post tenable 6 months ; salary £400–£500, less agreed deduction for married quarters and emoluments or £100 p.a. for single residential emoluments.

Apply with full particulars to the Group Secretary, Hospital Management Committee, St. Martins-road, Caerphilly, near Cardiff.

TREDEGAR, MONMOUTHSHIRE. ST. JAMES HOS-PITAL. (156 Beds for acute medical, geriatrics, obstetrics including abnormal cases—24 miles Cardiff and 6 Vale of Usk.) HOUSE OFFICER (pre-registration if suitable candidate available). Busy Pathology Department with Group Blood Bank. Salary £400–£500, less appropriate deduction for married quarters.

Apply with full particulars to Group Secretary, Hospital Management Committee, St. Martins-road, Caerphilly, near Cardiff.

TUNSTALL, BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

TUNBRIDGE WELLS. KENT AND SUSSEX HOSPITAL. (276 staffed available beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited (Male or Female) for post of RESIDENT HOUSE SURGEON, approved as pre-registration post, vacant at the end of April, 1954, for 6 months in the first instance.

Applications, stating age, qualifications, nationality and experience, with copies of recent testimonials, to Hospital Secretary.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, Hawkey's-lane, NORTH SHIELDS. (109 Beds.) Applications are invited from practitioners qualified at least 1 year for the resident appointment of SENIOR HOUSE PHYSICIAN, and should be sent with 2 testimonials to Group Secretary, Preston Hospital, North Shields, Northumberland.

WELSH REGIONAL HOSPITAL BOARD.

SENIOR REGISTRAR (general medicine), Morriston Hospital, Morriston, near Swansea, may also be expected to serve other hospitals within Group. Appointment for a period of 2 years in the first instance, but subject to review end of first year.

REGISTRAR (general surgery), Morriston Hospital, Morriston, near Swansea (non-resident).

REGISTRAR (general surgery), East Glamorgan Hospital, Church Village, near Pontypridd, may also be expected to serve other hospitals within Group. House available.

REGISTRAR (general surgery), Merthyr General Hospital, Merthyr (120 Beds), will also serve other hospitals within Group (resident or non-resident).

Subject to review at the end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WINDSOR. KING EDWARD VII HOSPITAL (Old WINDSOR UNIT), OLD WINDSOR, BERKS. RESIDENT PÆDIATRIC REGISTRAR required at above Hospital. Possession of D.C.H. desirable. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to the Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 4th April.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery required (Male or Female). Post vacant 18th May. Recognised for F.R.C.S. Preference given to persons seeking pre-registration House Officer post under Medical Act, 1950. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials or names of 2 referees, to Hospital Secretary by 11th April.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE, SOUTH WEST METROPOLITAN REGION. Applications are invited for the post of REGISTRAR in the Department of Pathology, preferably resident. The person appointed will work at the main hospital (311 Beds). Work will include all branches of pathology. Post recognised by the Examining Board in England for Diploma in Pathology.

Application forms obtainable from Secretary, Royal Hampshire County Hospital, Winchester, to be completed and returned within 14 days of publication of this advertisement.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION. Applications are invited for RESIDENT SURGICAL REGISTRAR for New Cross Hospital (636 Beds) with some duties at The Royal Hospital (310 Beds), preferably F.R.C.S. Appointment vacant now.

Apply, naming 3 referees, to Group Secretary, The Royal Hospital, Wolverhampton.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.

New Cross Hospital, Wolverhampton
HOUSE OFFICER (general surgery), vacant now.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.
The Royal Hospital, Wolverhampton.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400, or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. THORACIC UNIT. Applications invited for the following appointment in the Leeds Regional Thoracic Centre (54 Beds) at Pinderfields General Hospital :—

SENIOR HOUSE SURGEON, salary £670 p.a., less a charge of £130 p.a. for board, lodging, &c., or
Locum SENIOR HOUSE SURGEON, salary £13 per week, less a charge of £2 10s. a week for board, lodging, &c.

Address written applications, with full particulars and 2 names and addresses for reference, to—

W. E. EASTWOOD, Deputy Group Secretary,
Hospital Management Committee No. 10 Wakefield B Group.
Victoria Chambers, Wood-street, Wakefield.

WARRINGTON INFIRMARY. Warrington and District HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from qualified practitioners for the vacancy of RESIDENT ANÆSTHETIST (Senior House Officer grade), Male or Female, at the Warrington Infirmary. Scale of salary £670 p.a., less £130 p.a. for residential emoluments.

Applications to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (228 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer), vacant now. Recognised for F.R.C.S.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant now.

East Riding General Hospital, Driffield, Yorks (247 Beds)

(*d*) HOUSE PHYSICIAN (first, second or third post), vacant end April. Duties to include acute and chronic sick and casualties. Pre-registration post.

(*e*) HOUSE SURGEON (first, second or third post), vacant end April. Recognised for F.R.C.S. General surgical duties. Pre-registration post.

Salary for (*a*) is £670 p.a. and for (*b*), (*c*), (*d*) and (*e*) is £350–£450 p.a. Fully qualified practitioners may apply for the pre-registration posts.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE.

County Hospital, York (Acute Hospital of 269 Beds with full Consultant staff)

CASUALTY OFFICER (with charge of orthopædic beds), resident or non-resident (Junior Hospital Medical Officer grade) as soon as possible. Salary £700–£50–£1000, less £153 if resident. Recognised for F.R.C.S.

County Hospital, York; City Hospital, York (Acute Hospital of 265 Beds with full Consultant staff); **Yearsley Bridge Hospital** (Infectious Diseases Hospital of 86 Beds)

Required as soon as possible SENIOR HOUSE OFFICER in Pædiatrics and Infectious Diseases to spend approximately half-time in connection with pædiatric duties at the County Hospital (22 pædiatric beds), City Hospital (32 pædiatric beds) and other hospitals in the Group, and approximately half-time at Yearsley Bridge Hospital. Candidates should have had previous experience of pædiatrics and infectious diseases. Preference given to holders of D.C.H. Salary £670 p.a., less £170 for residence at Yearsley Bridge Hospital.

Applications, giving age, nationality, experience, qualifications, and names of 2 referees, to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for a whole-time resident post as SENIOR HOUSE OFFICER in Pædiatrics at Lissue Hospital, Lisburn.

Applications should be made on a form which may be obtained (with further particulars), from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44/46, Queen-street, Belfast, and will be received not later than 26th April, 1954.

NEW ZEALAND. WELLINGTON HOSPITAL BOARD. Applications are invited from registered medical practitioners for the position of SURGICAL REGISTRAR (either Senior or Junior) at the Hutt Hospital. Duties to commence as soon as possible and continue for balance of 1954. Applicants as Seniors must either hold an appropriate higher qualification, or at date of commencement of duties, be qualified for 5 years, including at least 2 years as a Junior House Surgeon, or a Senior House Surgeon, or a Junior Registrar. Applicants as Juniors must at date of commencement have had 2 years experience since graduating, including 1 year as House Surgeon. Salaries in accordance with the Hospital Employment Regulations ; the commencing salary for a Senior Registrar being £806 5s. p.a., and for a Junior Registrar £691 5s. p.a., both amounts being subject to the general wage increase of 10% with a maximum of 24s. per week. In addition an allowance at the rate of £179 8s. p.a. is payable to a Registrar required or authorised to live out.

Applications, stating age, qualifications, whether married or single and giving a complete concise statement of experience, will be received by the undersigned up to 4 P.M. on Monday, 12th April, 1954. J. B. I. COOK, Secretary.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 700-Bed University-teaching, General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1620–$2220 annually, plus laundry, uniforms, and room.

Address inquiries to Medical Director.

Public Appointments

BELFAST. CITY OF BELFAST. Senior Medical Officer (Health Department). Applications are invited from Male registered medical practitioners who must be under 45 years of age on the date they would take up duty, if appointed. They must hold a Degree or Diploma in Public Health, State Medicine or Sanitary Science and have adequate and suitable experience in general public health duties (whole-time) for a period of at least 2 years. Appointments are subject to the approval of the Ministry of Health and Local Government for Northern Ireland. The salary scale is £1250–£50–£1650, the commencing figure to be determined having regard to previous experience and additional qualifications. Superannuation contributions will be payable at the rate of approximately 6% of remuneration. Reciprocal arrangements have been made with other local authorities in Great Britain and Northern Ireland regarding transfer of superannuation rights. Preference given to suitably qualified ex-servicemen. Canvassing will disqualify.

Application forms and appointment conditions are obtainable from the Health Department, Room 53, City Hall. Completed applications must reach the undersigned not later than Thursday, 15th April, 1954.

City Hall, Belfast. JOHN DUNLOP, Town Clerk.

BRIGHTON CORPORATION HEALTH DEPARTMENT. Temporary Part-time MEDICAL OFFICER required for afternoon Infant Welfare Clinics. Remuneration on B.M.A. scale.

Apply Medical Officer of Health, Royal York Buildings, Brighton, 1. W. O. DODD, Town Clerk.

CHESHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT COUNTY MEDICAL OFFICER on the County Medical staff (South Cheshire area). The work will be concerned mainly with medical inspection of school-children, and experience in the ascertainment of handicapped children will be an advantage. It will also include attendance at child welfare centres. The appointment is superannuable and subject to medical examination. Salary scale £950–£50–£1300, with car allowance and subsistence allowance according to the county scale (previous experience will be taken into consideration).

Forms of application may be obtained from the undersigned, to whom they should be returned not later than 10th April.

ARNOLD BROWN, County Medical Officer.
24, Nicholas-street, Chester.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
MANCHESTER SOUTH WEST. .	LANCASTER . .	10TH APRIL, 1954
SOUTHPORT	LANCASTER . .	10TH APRIL, 1954

LEEDS EDUCATION COMMITTEE. Applications are invited from duly qualified medical practitioners for appointment as SENIOR SCHOOL MEDICAL OFFICER. The officer appointed will work under the direction of the Principal School Medical Officer who is also Medical Officer of Health. He will be required to perform such other duties as the Council may from time to time determine. The salary scale is from £1250 by £50 to £1650 a year. Commencing salary determined in accordance with experience. The post is superannuable and the person appointed will be required to pass a medical examination. The officer appointed will be restricted from engaging in private practice.

Forms of application may be obtained from the undersigned and must be returned within 14 days from the appearance of this advertisement. Canvassing in any form, either directly or indirectly, will be a disqualification.

GEORGE TAYLOR, Chief Education Officer.
Calverley-street, Leeds, 1.

The Province of Manitoba requires a

RADIOLOGIST

Duties: To act as Consultant to Provincial Diagnostic Units and Mental Hospitals and to give technical direction to technical staff.

Qualifications: Certification by the Royal College of Physicians and Surgeons.

An automobile is provided.

Salary: $10,000 (approx. £3700) p.a.

Reply, stating qualifications and experience, to:

DEPUTY MINISTER OF HEALTH,
212, Legislative Building,
Winnipeg, Manitoba.

HER MAJESTY'S COLONIAL RESEARCH SERVICE. EAST AFRICA TSETSE AND TRYPANOSOMIASIS RESEARCH AND RECLAMATION ORGANISATION. Applications are invited from Male candidates for the post of PROTOZOOLOGIST to undertake research in the human and animal trypanosomes. Candidates should possess a medical or veterinary degree or diploma registrable in the United Kingdom and have had 2 years postgraduate research experience: a sound knowledge of protozoology is essential. Candidates otherwise suitable, but with neither medical nor veterinary qualification, may also be considered. Appointment would be on probation with superannuation under the Colonial Superannuation scheme. Salary, including overseas research allowance, varies according to qualifications:—

1. Officers with medical qualifications would be appointed to one of the Medical Research Officer grades £840–£1000, or £1050–£1300, or £1320–£1520 a year.

2. Officers with veterinary qualifications would be appointed to one of the Scientific Officer grades £825–£1040, or £1140–£1320, or £1350–£1550 a year.

3. Suitably qualified officers without medical or veterinary qualifications would be appointed to one of the Scientific Officer grades £660–£790 or £885–£1170, or £1240–£1550 a year.

A cost-of-living allowance is payable at present at the rate of 35% of the sum of salary and overseas research allowance, up to maximum of £350 p.a. Outfit allowance of £60 also payable on first appointment. Government quarters are provided at rental of 10% of basic salary only. Free passages for officer, wife, and children under the age of 13.

Application forms are obtainable from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 195/198/01).

HER MAJESTY'S COLONIAL SERVICE, Nyasaland. MEDICAL OFFICERS are required for general medical duties Appointments can be made on a permanent basis with pension (non-contributory) at the normal retiring age of 55. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights (up to a limit of 6 years) during their time in Nyasaland and receive a resettlement grant of 20% of the aggregate of their Nyasaland salary on leaving Nyasaland at the end of their engagements. Salary scale ranges from £870 to £1695 p.a. Starting-point in the scale is determined according to age, qualifications and experience. A cost-of-living allowance (non-pensionable) is also payable and varies according to salary from £114 to £195 a year. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Quarters are provided at low rental. Income-tax at local rates. Free passages in both directions are provided for Officer and family up to the cost of 3 adult fares. Annual local leave is permissible and generous home leave is granted after each tour of from 2–3 years. Candidates must possess qualifications registrable in the United Kingdom.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117/4/03).

NORTH WESTERN GAS BOARD. Applications are invited from registered medical practitioners for the pensionable appointment of MEDICAL OFFICER at a commencing salary of £1600 p.a. The Doctor appointed will be required to reside within reasonable distance of Bolton and to act as Industrial Medical Officer to the Board's Undertakings in the industrial belt around Manchester, for which a mobile Consulting-room will be available. Further details may be obtained on application.

Applications, giving the names of 3 referees, should reach the Secretary, North Western Gas Board, 60, Whitworth-street, Manchester, 1, within 14 days.

NORTHUMBERLAND COUNTY COUNCIL. Applications are invited from registered medical practitioners for the appointment of an ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary will be in accordance with the scale of £950 rising by annual increments of £50 to £1300 p.a. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application and any further particulars required may be obtained from the undersigned and must be returned not later than 24th April, 1954.

JOHN B. TILLEY, County Medical Officer.
County Hall, Newcastle upon Tyne, 1.

NORTHUMBERLAND. COUNTY OF NORTHUMBERLAND. National Health Service Act, 1946. Joint appointment of AREA EXECUTIVE MEDICAL OFFICER for the West Area and MEDICAL OFFICER OF HEALTH for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle, and Hexham. Applications are invited from registered medical practitioners for the joint appointment of Area Executive Medical Officer for the West Area and Medical Officer of Health for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle, and Hexham. The salary for the joint appointment will commence at £1487 10s. and rise by 3 annual increments of £56 5s. and 1 of £62 10s. to £1718 15s. plus a travelling allowance in respect of a motor-car not exceeding 12 h.p. The person appointed will be required to give his, or her, whole time to the duties of the joint appointment and must not engage directly or indirectly in private practice. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, to the national conditions of service and to 3 months notice in writing on either side, and the successful candidate will be required to pass a medical examination.

Application forms may be obtained from the Clerk of the County Council, County Hall, Newcastle upon Tyne, 1, to whom applications must be submitted not later than 31st March, 1954.

General Practice

For an Executive Council post (England and Wales) apply on form E C.16A obtainable from the council. Mark envelope "Vacancy."

INGRAVE HOUSING ESTATE, BRENTWOOD, ESSEX. Applications invited for VACANCY (mixed urban and rural) on new housing estate. Not retirement or death vacancy. No list of patients. Subject to appropriate conditions, initial practice allowance will be payable. Accommodation will be made available by arrangement with East Ham County Borough Council. Apply on Form E.C.16A by 12th April, 1954, to—

E. BERGDAHL, Clerk of the Council.
Essex Executive Council, 131/3, Fillebrook-road,
Leytonstone, E.11.

Hospital Services: Non-Medical Appointment

LENNOXTOWN. LENNOX CASTLE INSTITUTION. Applications are invited for appointment as CLINICAL PSYCHOLOGIST at above institution. Salary scale of £415–£35–£450–£50–£500 during probationary period and £575–£30–£815–£35–£850 after obtaining certificate of proficiency. Terms and conditions of service in accordance with Whitley Council Regulations.

Applications, giving details of qualifications and experience, together with names and addresses of 3 referees, to Group Secretary, Board of Management, Lennox Castle and Associated Institutions, 113, Douglas-street, Glasgow, C.2.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Industrial Medical Officer (part-time) required at Smethwick Factory of large organisation. Present duties occupy between 1–2 hours per week. Commencing fee £117 p.a. Local General Practitioner preferred.—Apply, Address, No. 910, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Exchange. Compact, easily run Rural Practice, W. Highlands, 1600 units, house and surgery at low rental, for Rural Practice, same size or larger, South or East Scotland or England. —Address, No. 911, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Wanted full- or part-time post as Secretary and/or Receptionist, South Hants. Public school, accounts, typewriter, own car. Highest references.—Capt. WOODFALL, Old Cottage, Bransgore, Hants.

Receptionist/Secretary, aged 27, desires post with doctor or dentist in Lincoln area to commence after Easter. Good qualifications. Would accept £300 p.a. to start.—Address, No. 909, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Well-known Nursing-home of high repute, standing in own grounds in good residential quarter, with open outlook, taking surgical, medical and maternity cases, for sale, in Midland Spa, owing to retirement of owner. Fully equipped theatre; 11 rooms (some double); all beds adjustable (Lawson Tait). Excellent staff accommodation. Consulting and waiting rooms. Oil-fired central heating. Aga stoves. Freehold.—For particulars apply to Secretary, Priors Nursing Home, 51, Lillington-road, Leamington Spa.

Medical and Maternity Home, South-East Kent; no opposition. 12 registered bedrooms, labour and maternity wards, usual offices, theatre. As Going Concern, £6000 inclusive, freehold, furnishings, equipment.—GARDENERS, The Parade, Canterbury (Tel. 3576).

Austin A30, A40, and A70 range—new Ford Popular and all Show Models. Limited number of orders now acceptable from proven essential users.—Application form, brochures, easy terms, from: H. A. SAUNDERS LTD., 140/144, Golders Green-road, London, N.W.11.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Haematology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

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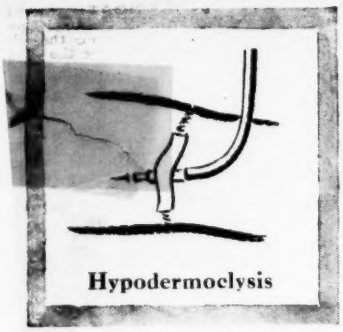
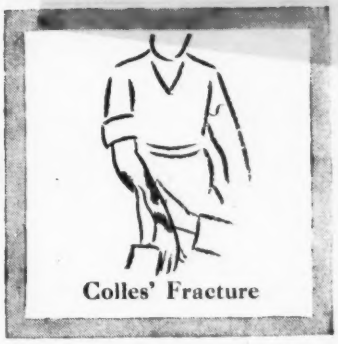
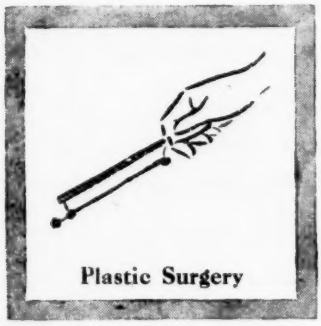


1 Hypodermoclysis



2 Colles' Fracture



3 Plastic Surgery

4 Ganglia

5 Pyelography

6 Leg Ulcers

7 Hæmatomata

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